

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Watts' Three-Cylinder Engine and Boiler.

Among the new engines exhibited at the Kilburn Show some months since was a three-cylinder engine, designed by Mr. C. T. Watts, of the Cordova Works, Grove Road, London. The chief point of interest of the engine is that it is the first one of the type with a variable expansion adjustable by the governor. From the accompanying engravings, for which we are indebted to *Engineering*, it will be seen that the cylinders *a a a* are placed side by side above the crank shaft, and are single acting, being fitted each with a deep piston, *b*, and tubular connecting rod, *d*. The three-throw crank shaft *c* is made without intermediate bearings, having made with it, on the crank webs, three cams, *g g g*. Each cam gives a reciprocating motion to a friction roller, *k*, and through it by the lever *j* to the valve rod *e*. The valve itself is of the piston type, and rests on the top of the rod *e*, being held against it always by steam pressure. In this way the roller *k* is kept up always against the cam. So long as the fulcrum of *j* remains in one position the cut-off remains, of course, unaltered. But this fulcrum is a pin in the lever *i*, which is keyed on a spindle, *h*, to which an angular motion can be given by the governor *l*. The position of *i* at any instant depends, therefore, on the position of the governor, which in this way (the form of the cam being suitably designed) regulates the cut-off automatically. The lever *i*, shown in Fig. 2, is simply used for increasing the available throw of the governor. Its outer end is linked to a short-arm, *h*, on the spindle *h*, mentioned above. This spindle is arranged so as to cut off at any point between one and seven-eighths of the stroke, and to open the valve fully, even at the early cut-off.

Figs. 4 and 5 illustrate Mr. Watts' patent high-pressure boiler in one of its latest forms. The boiler shell is a flat-sided, nearly rectangular vessel, in which the place of stays is taken by tubes. The products of combustion pass through these first from front to back, then from one side to the other, and down to the bottom of the boiler, and only at the last (when they are too much reduced in temperature to overheat the tubes) from bottom to top, through tubes partly in water and partly in steam space. The tubes acting as stays are secured, as shown, by double nuts at each end. The boiler is set in brickwork, arranged so as to be easily accessible in its different parts. It has a horizontal cylindrical steam chest placed above it, as shown in Fig. 4. These boilers are proved to 140 pounds per square inch.

SCIENTIFIC AND TECHNICAL.

Capt. John E. Greer, of the Ordnance Department, U. S. A., gives the following account of

A NOVEL USE OF THE TELEPHONE.

Hitherto the accurate determination of the time of flight of small-arm projectiles has been practically impossible at long ranges, owing to our inability to see them strike, even when firing over water. The discovery of the telephone has opened up to us a simple as well as a novel means of obtaining the time desired, and has also afforded us the means of verifying the formulas by which these times were formerly adduced. In these experiments two telephones provided with Blake transmitters (a form of Edison's carbon telephone) were used. One was placed within a few feet of the gun, and left open to receive and transmit the sound of the discharge. The other was in the shelter-proof, which was about 30 feet in front of the right edge of the target. A stop watch, beating fourths of a second, was used in connection with it. The telephone being at the ear, the instant the sound of the discharge was received at the target the watch was started, and, on the bullet striking, was stopped. A mean of a large number of observations, which rarely differed more than a quarter to half of a second from each other, gave the time of flight. Of course there is a slight delay in starting the watch, but this is neutralized by a similar one in stopping it. The time given may, therefore, be accepted as strictly correct. It is worthy of notice that the times vary on different days, being shortened by a rear and lengthened by a head wind. The velocity of sound may be readily obtained with the telephone in the same manner. The time for the sound of the discharge passing through the air was always shown by the watch, but as it was not desirable for my purpose to stop the watch until the bullet reached the target, these times were not taken.

An interesting and expensive experiment has just been concluded in England with

PERKINS' HIGH PRESSURE ENGINE SYSTEM.

Mr. J. C. Lambert some time since built a yacht, the *Wanderer*, 175 feet long, 29 feet beam, 13 feet average draft and 700 tons measurement, and determined to give the Perkins system of using steam of 400 lbs. pressure a trial. The vessel was accordingly fitted up with three cylinders, 48, 34 and 17 inches in diameter respectively, the 17-inch cylinder standing on top of the 34-inch cylinder. These two were single acting, the pistons being connected by their rods. Steam of 400 lbs. pressure was admitted to the top

of the 17-inch piston, sending it down, and then passing under the 34-inch piston sent it up. From this cylinder it went into the valve chest of the 48-inch cylinder, the piston of which was double acting, in the usual way. The stroke of all the pistons was 2 feet 6 inches. One of the essential features of the system is that steam is generated from distilled water, and to make up for waste, distilled water is carried along in tanks. Therefore the waste ought never to exceed 5 per cent. of the whole quantity required for the feed. This was not the case in the *Wanderer* engines, with which much trouble was experienced, besides, in connection with the slide valve of the 48-inch cylinder.

mental Philosophy" (1743). The print bears the date of 1719, is by Tho. Barney, and has the inscription: "The steam engine near Dudley Castle, invented by Capt. Savory and Mr. Newcomen. Erected by ye later 1712."

A young physician of this city has invented AN INSTRUMENT FOR MEASURING THE PULSE which is very simple. It is described by a writer in the *Times* as follows: A minute disk of hard rubber firmly fixed to the base of a graduated tube, such as is used in the manufacture of thermometers, forms the essential part of the instrument. At the base,

A CURIOUS MINE EXPLOSION, which occurred on the 28th of July in the Rochelle Mine, Department of Gard, France. Two miners were working in the Fontanes pit, at a depth of 1132 feet, when they heard a report somewhat similar to that of a fire-damp explosion, though shorter, which, in less than a minute afterward, was followed by a second louder one. At this moment the lamps were extinguished, and the men, feeling faint, had hardly time to throw themselves into the cage, which was at once hoisted by the engineer. They thus escaped death, being more fortunate than three of their comrades, who, working in the same

to be that gas by a test with lime water. M. Delesse, who in this point is supported by M. Dumas, gives the following explanation of the presence of such enormous quantities of gas, estimated at a maximum of 160,000 cubic feet: Near the coal seam is a deposit of iron pyrites, which, by a decomposition, furnishes a large quantity of sulphuric acid. The latter is dissolved in the water circulating in the rocks, and is carried to strata of limestone underlying the coal, which it decomposes, setting free large masses of carbonic acid. The latter gathers in seams and vugs, and not being able to escape reaches a high pressure.

Coating Iron with Iridescent Copper.

The following is a description of a new process of coating iron with a film of copper, which is of French origin. The metalizing bath and the best proportions of ingredients are indicated in the following directions: First, 35 parts of crystallized sulphate, or an equivalent amount of any other salt of copper, are precipitated as hydrated oxide by means of caustic soda or some other suitable alkaline base; this oxide of copper is to be added to a solution of 150 parts of Rochelle salt and dissolved in 1000 parts of water; to this add 60 parts of best caustic soda, containing about 70 per cent. NaOH, is to be added, when a clear solution of copper will be formed. Other alkaline tartrates may be substituted for the Rochelle salt above mentioned, or even tartaric acid may be employed; but in the case of tartaric acid or acid tartrates a small additional quantity of caustic alkali must be added, sufficient to saturate the tartaric acid or acid tartrate. Oxide of copper may also be employed, precipitated by means of hypochlorite, but in all cases the proportions between the copper and the tartaric acid should be maintained as above, and it is advantageous not to increase to any notable extent the proportion of the caustic soda. The object to be coppered is to be cleaned with a scratch brush in an alkaline-organic bath, attached as a cathode, immersed in the coppering bath and treated with the usual precautions, when it will become rapidly coated with an adherent film of metallic copper.

As the bath gradually loses its copper, oxide of copper, as above prepared, should be added to maintain it in a condition of activity; but the quantity of copper introduced should not ordinarily exceed that above prescribed, as compared with the quantity of tartaric acid the bath may contain. If the quantity of copper notably exceeds this proportion, certain metallic iridescences are produced on the surface of the object. These effects may be employed for ornamental and artistic purposes. According to the time of the immersion, the strength of the current and the proportion of copper to the tartaric acid, these iridescences may be produced of different shades and tints, which may be varied or intermingled by shielding certain parts of the object by an impermeable coating of paraffine or varnish while the iridescent effect is being produced on the parts left exposed. All colors, from that of brass to bronze, scarlet, blue and green, may be thus produced at will. If it be desired to deposit nickel, the only modification of the above process requisite is the substitution of precipitated oxide of nickel for the oxide of copper, produced by precipitation, as above mentioned.

Preservation of Iron Surfaces.—In a note on this subject Mr. C. Graham Smith says: The paints used for ironwork are of every description, name and quality. The usual varieties employed for preserving it against corrosion may be divided into lead, iron oxide, silicate and tar paints. Differences of opinion exist as to the relative merits of the first three descriptions, but the experience of three foremen painters connected with establishments in England is decidedly in favor of lead paints, when of good quality and mixed with good oil without spirits. Unfortunately, there are no reliable, practical tests to insure good materials alone being used. Consequently, both the colors and the oils are often inferior in quality and much adulterated. For these reasons and on account of cheapness, iron oxide paints are by some preferred. A little white lead mixed with red makes it go further and easier to work into corners. If the first coats are put on with pure red lead, owing to its weight it is liable to run off; but the last coat should consist of red lead alone. The tar paints are more often used for ironwork which is not to be seen, such as water pipes, floor plates for bridges, and girders which are to be built into masonry or brickwork. It is cheap and answers well for such purposes and for sea-work, as it is said not to foul so readily as lead or other paints of a finer description. A good rough paint is made by heating coal tar and mixing with it finely sifted slaked lime, in the proportion of between half a pound and a pound of lime to a gallon of tar, adding sufficient naphtha to render it of a convenient consistency for laying on. This composition should be applied while hot, but not too hot. Do not keep it over the fire too long, or it will lose its essential oils. Some positions admit of the paint being sanded, in which case it should be done, as it adds to its durability. Before painting iron, give it a coat of boiled linseed oil applied hot.

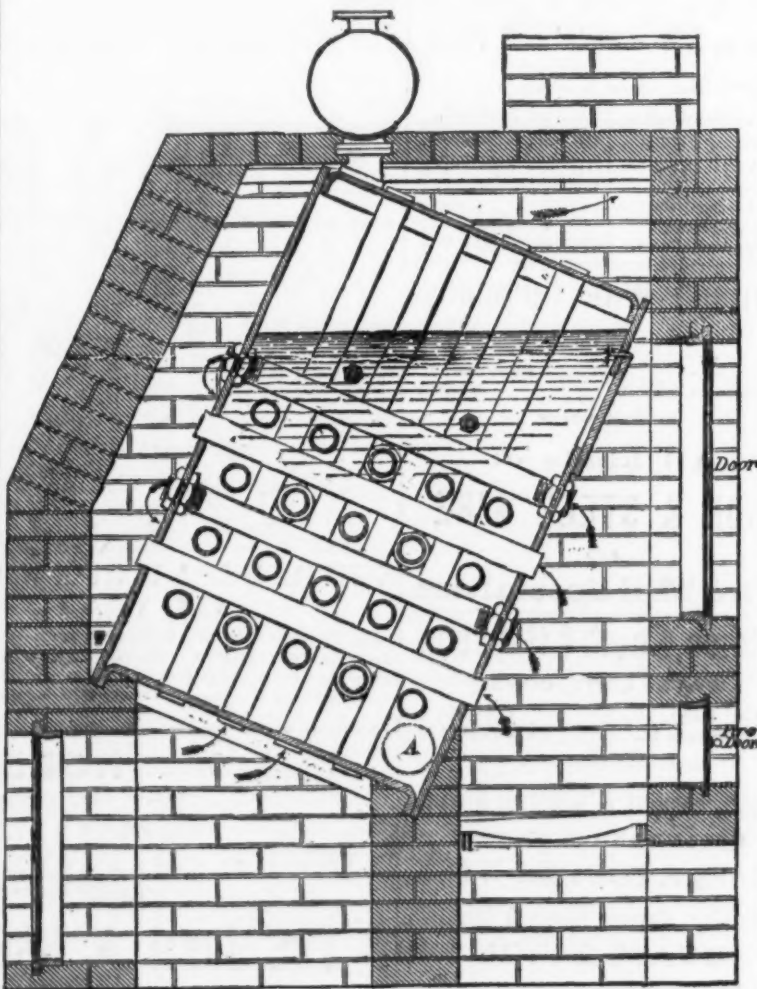


Fig. 4.—Vertical Section of Watts' High Pressure Boiler.

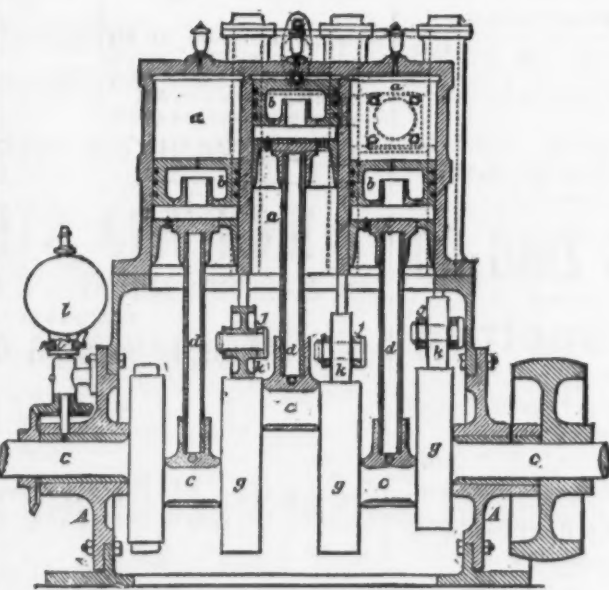


Fig. 3.—Longitudinal Section of Watts' Engine.

WATTS' THREE CYLINDER ENGINE AND BOILER.

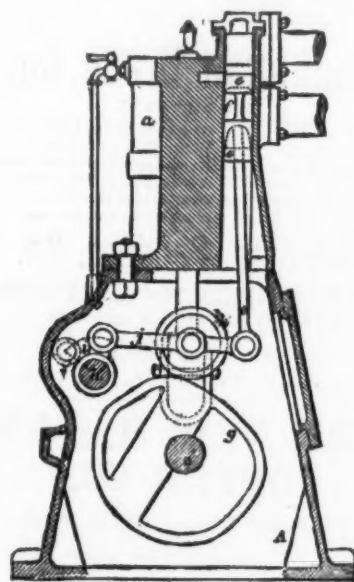


Fig. 1.—Section of Watts' Engine.

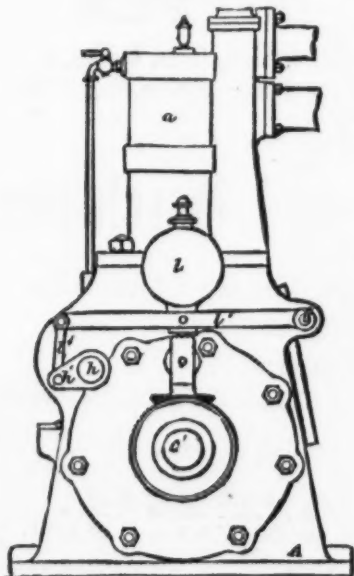


Fig. 2.—End View of Watts' Engine.

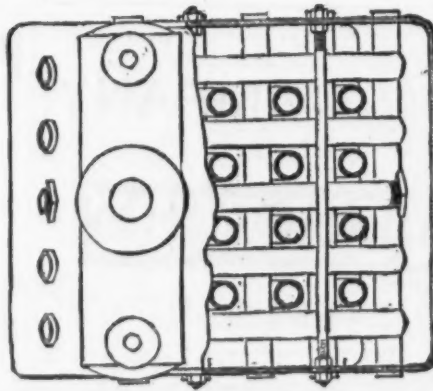


Fig. 5.—Plan of Watts' Boiler.

tion with the slide valve of the 48-inch cylinder. It was found during a trial trip in the Bay of Biscay that, owing to an improper distribution of the weight, the ship rolled fearfully, and that other drawbacks rendered the machinery unfit for the purpose. The *Engineer*, in discussing the failure, says that while it is not fatal to high pressures, the system has a future only if the consumption of fuel can be reduced to 1.25 lb. per hour per horse power.

The *Engineer*, in a recent issue, gives a fac-simile of an old print illustrating

THE NEWCOMEN ENGINE IN 1712,

from which it appears that the self-acting valve gear was used by him about 6 years earlier, at least, than is generally supposed on the authority of Desaguliers' "Experi-

where the rubber diaphragm is adjusted to it, the glass tube is somewhat expanded in diameter, so as to form, with the diaphragm for a floor, a receptacle capable of holding a few minims of water colored with carmine. The remainder of the tube has the internal diameter of that of our ordinary medical thermometer. When the disk of the instrument is placed firmly upon or against the wrist, the vibration of the tissues beneath caused by the artery is communicated to it, and the colored liquid dances up and down in the tube, registering to the eye of the practiced physician the force and particular description of each wave. Simple as the instrument is, its delicacy and accuracy are marvelous.

M. Delesse has drawn the attention of the Academy of Sciences to

pit on the 807-foot level, were asphyxiated. An examination of the mine proved beyond a doubt that the explosion was not due to fire-damp; no flames had accompanied them, there were no traces of fire, and cartridges prepared for blasting had not been exploded. Fire-damp had never been noticed at the Rochelle Mine, and all lamps used were open, but, on the other hand, the presence of carbonic acid had often been observed, and 6 to 7-foot holes had always been kept ahead of the workings in order to facilitate the escape of the gas. Sometimes the miners had to leave work, notwithstanding this precaution. The gallery was filled for a length of 50 feet with fragments of coal, and an opening 30 feet deep was found ahead. Carbonic acid rose within 160 feet of the surface, and it could be readily proved

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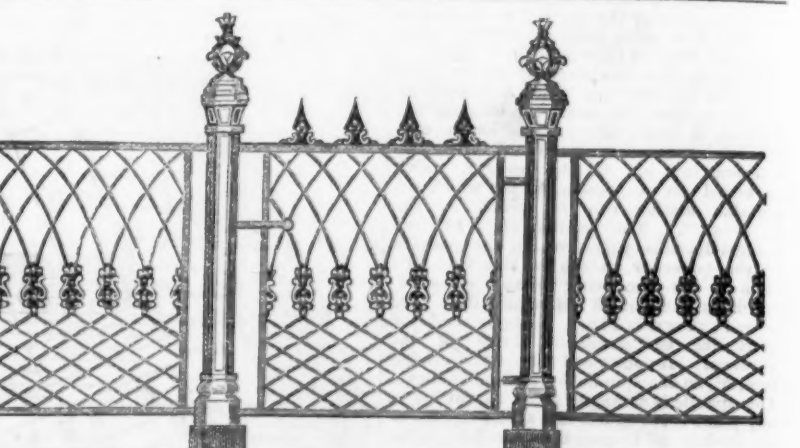
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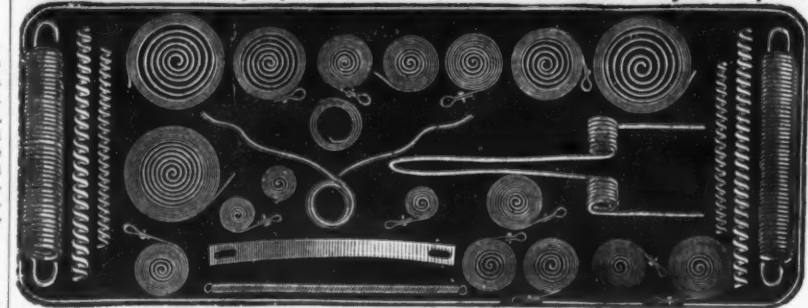
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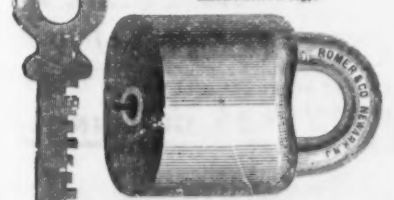
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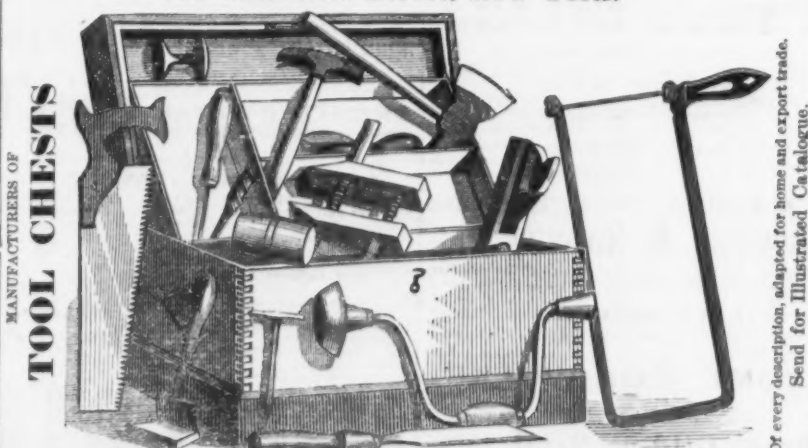
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Properties of the Alloys of Copper and Tin.

(Concluded.)

COMPARISON OF RESISTANCES.

It appears that the tensile and compressive strengths of the alloys are in no way related to each other, that the torsional strength is closely proportional to the tensile strength, and that the transverse strength may depend, in some degree, upon the compressive strength, but it is much more nearly related to the tensile strength. The modulus of rupture, as obtained by the transverse tests, is, in general, a figure between those of tensile and compressive strengths per square inch, but there are a few exceptions in which it is larger than either.

From the table of transverse, tensile and torsional strengths, it is seen that the strengths of the alloys at the copper end of the series increase rapidly with the addition of tin till about 4 per cent. of tin is reached. The transverse strength continues regularly to increase to the maximum, till the alloy containing about 17½ per cent. of tin is reached, while the tensile and torsional strengths also increase, but vary irregularly, to the same point. As this irregularity corresponds to the irregularity in the specific gravities, it is probably due to porosity of the metal, and might possibly be removed by any means which would make the castings more compact. The maximum point of the three tables is reached at the same point, viz., at the alloy containing 82.70 copper, 17.34 tin, the transverse strength, however, being very much greater at this point than the tensile or torsional strength. From the point of maximum strength the figures of the three tables drop very rapidly to the alloys containing about 27.5 per cent. of tin, and then more slowly to 37.5 per cent., at which point the minimum (or nearly the minimum) strength, by all three methods of test, is reached. The alloys of minimum strength are found from 3.75 per cent. tin to 52.5 per cent. tin, the observation being somewhat irregular between these points, making it difficult to state the exact minimum points, but agreeing in showing great weakness. The absolute minimum is probably about 45 per cent. of tin.

From 52.5 per cent. of tin to about 77.5 per cent. tin there is a rather slow and irregular increase in strength to the point which has been called the second maximum, the transverse stress at this point, as at the first maximum, rising much higher than the other two figures. The former, also, does not reach its second maximum at the same point as the two latter, but this may be accidental. From 77.5 per cent. tin to the end of the series, or all tin, the strengths slowly and somewhat irregularly decrease, the second minimum being reached at the end of the curve. It will be noticed that the irregularity of the torsional strength is much less than those of the others, which is probably due to the fact that in the torsional tests the time occupied in making the tests was very uniform, and also that the figure for torsional stress is made from the average results of, usually, four tests of each bar, while the tensile tests were but two in number from each bar and the transverse tests but one. One of the most important facts to be learned from the tables is that all the alloys containing more than 25 per cent. tin are practically worthless for all purposes where strength is required, the average strength of these alloys being only about one-sixth of the average of that containing less than 25 per cent. of tin.

COMPARISON OF DUCTILITY.

The ductility in the tensile tests was determined by direct observations of the elongations of the pieces under tension. In the cases of the brittle alloys these elongations were such very small quantities that they could not be measured. The ductility in the transverse tests was determined by the final deflections before breaking, and this was always an appreciable quantity, even with the brittle alloys. The ductility by torsional tests is determined from the extension of the exterior fiber or line of particles in the torsion piece 1 inch long in parts of an inch, which is calculated from the angle of torsion given by the autographic strain diagram. This gives a correct comparison of the relative ductility of all the pieces tested, whether very brittle or very ductile, and the comparative ductility is given in the figures in the table of summary of results. The maximum angle of torsion given in the summary is 556.75 degrees, which corresponds to an extension of 2.1975 inches of a line of particles originally 1 inch long, on a cylinder ½ inch in diameter, on the supposition that the diameter and length of the cylinder while being twisted remained unchanged. The minimum angle of torsion is 0.4 degree, which corresponds to an extension of only 0.00006 inch. The alloys containing less than 12.5 per cent. and more than 87.5 per cent. of tin, are so ductile that bars 23 inches in length bend to a deflection of more than 3½ inches without breaking, and their comparative ductility is not, therefore, determined by this method of test. Bar No. 1, all copper, is an exception, but it was considered to be a defective bar. Bar No. 30, all copper, bent without breaking. Beginning at pure copper, the ductility increases slightly with the addition of tin till from 2 to 4 per cent., between which limits the maximum ductility of the stronger alloys is reached. From this point there is a regular decrease of ductility to 25 per cent. tin, at which point it becomes very small. The record of comparative ductility by tension is then entirely lost up to the alloy containing 75 per cent. tin, while that by torsion can be traced from the figures in the table of summary of results. From these figures it is seen that the minimum ductility is reached at from 37.5 to 47.5 per cent. tin, which corresponds nearly to the minimum point of strength.

The data of ductility by transverse strength, commencing at about 13.5 per cent. tin, show a regular decrease to about 35 per cent. tin, and from that point to 55 per cent. tin it is nearly uniform, indicating a minimum at 45 per cent., thus agreeing with the results obtained from the torsional tests. From 55 per cent. tin there is a very regular increase to 87.5 per cent. tin.

VARIATION IN STRENGTH OF GUN BRONZE, AND MEANS OF IMPROVING THE STRENGTH.

The figures obtained for alloys of 7.5, 10, and 12.5 per cent. tin, viz., 27,900, 26,680 and 31,100 pounds, are much less than is usually given as the strength of gun metal. It must be remembered, however, that bronze guns are usually cast under the pressure of a head of metal, which tends to increase the strength and density. The strength of the upper part of a gun casting, or sinking head, is not greater than that of the small bars which have been tested in these experiments. The following are a few extracts that have been made from the report of Major Wade concerning the strength and density of gun bronze:

Bronze Guns made at Chicopee, Mass., 1850.

| | Specific gravity. | Tenacity. |
|---|-------------------|-----------|
| Tin, one part..... | 7.927 | 2,122 |
| Copper, eight parts (mean of nine samples)..... | 8.762 | 24,252 |
| Mean of 88 guns..... | 8.751 | .. |
| Mean of 83 gun heads..... | 8.593 | 29,655 |

Extreme variation of six samples from different parts of the same gun (a 32-pounder howitzer): Specific gravity, 8.487 to 8.835; tenacity, 26,428 to 52,192. Extreme variation of all the samples tested: Specific gravity, 8.308 to 8.850; tenacity, 23,108 to 54,531. Extreme variation of all the samples from the gun heads: Specific gravity, 8.308 to 8.756; tenacity, 23,529 to 35,484. The materials used in all these castings were of the same quality; they were melted, cast and cooled in the same manner, and were designed to be similarly treated in all respects. In the conclusion of his report on gun bronze, Major Wade says: "The general results which are exhibited in this report, on the quality of bronze as it is found in guns, are mostly of a negative character. They expose defects in density and strength, develop the heterogeneous texture of the metal in different parts of the same gun, and show the irregularity and uncertainty of quality which attend the casting of all guns, although made from similar materials, treated in like manner. The ascertained facts which this report exhibits, although they relate chiefly to existing imperfections in the art of manufacturing bronze, will, it is believed, be found useful. They may serve to awaken the attention of those who may henceforth be concerned in conducting this branch of service, and to suggest such improved methods of treating the materials as will ultimately raise our knowledge of the art to an equality with that which has been obtained in the manufacture of iron cannon." That the strength of ordinary ordnance bronze is still variable, 20 years after Major Wade's report was written, is shown by the following records of 12 tests made by the Ordnance Department, United States Navy, and furnished to the writer by Capt. William N. Jeffers, U. S. N., Chief of the Bureau of Ordnance.

Navy Ordnance Bronze, Tested in 1875 and 1876 at Washington D. C.

| Mark. | Tensile strength per square inch. | Transverse strength per square inch. | Specific gravity. |
|-------------|-----------------------------------|--------------------------------------|-------------------|
| M 1..... | 42,037 | 70,000 | 47.05 |
| M 2..... | 41,768 | 71,600 | 47.8 |
| B B*..... | 22,385 | 10.0 | 41.7 |
| M 3..... | 45,737 | 51.2 | 47.0 |
| No 3f..... | 49,774 | 65,600 | 46.03 |
| No 4f..... | 48,000 | 60,000 | 41.1 |
| G B 2..... | 35,820 | 40.75 | 50. |
| G B 1..... | 20,818 | 3.91 | 49.392 |
| B 3 Lf..... | 31,630 | 39,000 | 13.4 |
| M 4 C..... | 31,450 | 31,600 | 38.0 |
| B 3 Ct..... | 45,837 | 72,450 | 39.6 |
| B 3 Ct..... | 44,865 | 71,600 | 41.5 |

* Full of large tin spots.

† Cast in chill mold.

‡ Flaw in the breaking portion.

The guns cast in chill molds were composed of 10 parts of copper to 1 part of tin; the others were made of 9 parts of copper to 1 part of tin. That a great improvement may be made in the density and tenacity of gun bronze by compression has been shown by the experiments of Mr. S. B. Dean in Boston, Mass., in 1869, and by those of General Uchatius in Austria in 1873.* The former increased the density of the metal next the bore of the gun from 8.321 to 8.875, and the tenacity from 27,238 to 41,471 pounds per square inch. The latter, by a similar process, obtained the following figures for tenacity:

| | Pounds per sq. in. |
|-----------------------------------|--------------------|
| Bronze with 10 per cent. tin..... | 74,093 |
| Bronze with 8 per cent. tin..... | 73,028 |
| Bronze with 6 per cent. tin..... | 77,656 |

The density of these specimens is not given, but it probably approaches very closely to 8.95. It is believed that the experiments of General Uchatius are still in progress.

It has been shown that the useful alloys, those which contain less than 27.5 per cent. of tin, have strengths which are nearly proportioned to their densities. A systematic investigation remains yet to be made to ascertain the various causes which operate to produce the blow-holes, which are the principal cause of the lack of density, and the means which may be taken to prevent the operation of these causes. As before stated, compression of the metal, either in the fluid state or after it has solidified, increases the density and consequently the strength, by closing the blow-holes and compressing the gas which the blow-holes contain. If the formation of the gas which causes these blow-holes can be prevented, or if it can be removed from the metal while the latter is still in a fluid state, it is evident that the cast metal will be entirely free from them, and a metal of greater density and strength will be obtained which will not need further compression.

No means has yet been discovered by which this desirable result may be accomplished, but it is not improbable that it may be done by a proper system of treatment of the fluid metal, or by the use of fluxes which shall chemically unite with the gas of the blow-holes and prevent its existence in the gaseous state. The subject offers a fruitful field for experiment, one which it is proposed to explore after concluding the researches in progress on castings of copper-tin, copper-zinc, and triple alloys.

* Ordnance Notes, No. XL, Washington, D. C., 1876.

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The History of Tin Mining in Bohemia and Saxony.

We are indebted to Dr. Ed. Reyer, an eminent Austrian authority, for the following data on the history of tin mining in Bohemia and Saxony, which is of interest as showing the comparatively rapid changes to which the working of tin deposits is subject. At the times of the Phoenicians and the Romans, Spain and England were famous as producers of tin, Cadiz in Spain, and later Marseilles being the main ports of shipment from which tin went to Italy and the East, where it probably competed with Indian tin. England kept its rank as an important producer during the first centuries of the Middle Ages, while Spain's output became of little significance. The pure stream tin of Devon was carried across France to Marseilles. Later, however, Bruges, in the Netherlands, assumed control of the tin market, and it was there that the merchants of Italy, France and Germany assembled every year in order to divide the supply of metal.

Affairs remained in this condition until the year 1200. At this time rich deposits were discovered in Graupen, in the Erzgebirge Mountains, and soon after those at Schoenfeld, in north-western Bohemia, were opened. In 1241 the rich Bohemian ores attracted much attention in England. Cologne then became a second great center besides Bruges. The mines of Ehrenfriedersdorf and Geyer, in Saxony, were then opened, and although those at the former place were rich, we have no record of the output of this or the other mines. It is only since the middle of the 15th century that reports of any value are extant. About this time (1458) Altenberg and Zinnwald commenced producing, the former turning out from 300 to 400 tons of tin per annum during the first decades. At the end of this century, Elbstock is first mentioned also, although it is probable that at this and other points mining reached further back. The working of the ores was much improved during the beginning of the 16th century. The ores, which were obtained either by building huge fires at the face of the rock, or by working with the pick and gad, were until then broken with hammers and ground in hand-mills. During the period mentioned stamp mills were introduced, first at Altenberg, then at Schlackenwald and other places. The concentrated ore obtained by working in sluices was calcined and smelted in little blast furnaces, with charcoal as fuel. Impure metal was liquated. While the washings of Schoenfeld grew poor, the mines of the neighboring small city of Schlackenwald were rapidly pushed to considerable importance by moneyed men from Nuremberg and Augsburg, 500 to 1000 tons of tin being made annually by the three villages, Schlackenwald, Schoenfeld and Lauterbach. As an instance of the enterprise shown in these days, it may be stated that a ditch more than thirty miles long carried water to the stamp-mills. The number of mines in operation during this time was increased by the opening of Gottesgab, Platten and Hengsterben.

Tinning sheet iron was adopted in Bohemia and Saxony in the beginning of the 17th century, and the process was carried to England in 1670, whence it was introduced later into France. A little earlier, in 1630, Drebbel, a German, taught the use of tin salts in dyeing. Almost all the mines were closed during the Thirty Year's War, and Bohemia and Saxony together did not produce more than 100 tons per annum. The persecution of Protestants in Bohemia drove many miners to Saxony, and notably to Zinnwald and Johanngeorgenstadt. The richer mines of both countries, it is true, recovered during the beginning of the 18th century, and enjoyed a second period of prosperity, although the methods of mining and dressing were still crude, and the smelting as practiced then involved a very large consumption of fuel and great losses. These drawbacks, and the low percentage of metal in the ores, caused tin mining to decline, and the method introduced in 1835 at Altenberg to treat the fine ore with hydrochloric acid, or that used since 1845 at Schlackenwald, to calcine with common salt, did not succeed in stopping the decline. Australian competition sealed the fate of Schlackenwald, Graupen and Zinnwald, and even Altenberg is working only at an annual loss. Hengsterben, it is true, has, on the other hand, been reopened recently by an English company. The percentage of metal in the ores is not higher than one-third of one per cent., taking the average of 300 years, and one-fifth of one per cent. is considered acceptable for stock-works as well as for lodes. Very few of the latter only yield from 1 to 3 per cent. of metal.

A Large Gas Holder.—Messrs. Ashmore and White, of Stockton-on-Tees, England, have just secured a contract for the erection of what will be the largest gas-holder in the world. It has been designed by Mr. George Livesey, for the South Metropolitan Gas Company. It is of the kind known as treble lift. The inner vessel is 208 feet diameter by 53 feet 6 inches deep in the sides; the middle vessel is 211 feet diameter by 53 feet 3 inches deep; and the outer vessel 214 feet diameter by 53 feet deep. It will thus be seen that when full, the top curb of this holder will be approximately 150 feet high above the tank water-line. The cubic capacity of the vessel will be 5,000,000 feet. The holder when at work will be retained in its position by means of 24 wrought iron stanchions, constructed of plate, bar and angle iron, tapering from 28 feet wide at the base to 22 feet at the top, and 165 feet high, or thereabouts. These are connected laterally by a series of strong horizontal struts or girders of + section, and by diagonal braces of flat iron, increasing in strength from the top downward. What a contrast, says the Engineer, we have here between modern gas engineering and the time, within the memory of many men, when a London gas company kept a few thousand feet stored in balloons for their customers; while the Chartered Gas Company was once so hard up for a gas-holder, that it purchased a second-hand brewer's vat and used it for the purpose.

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Fig. 99 1/2.



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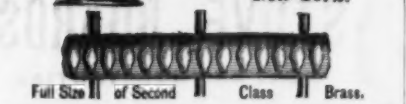
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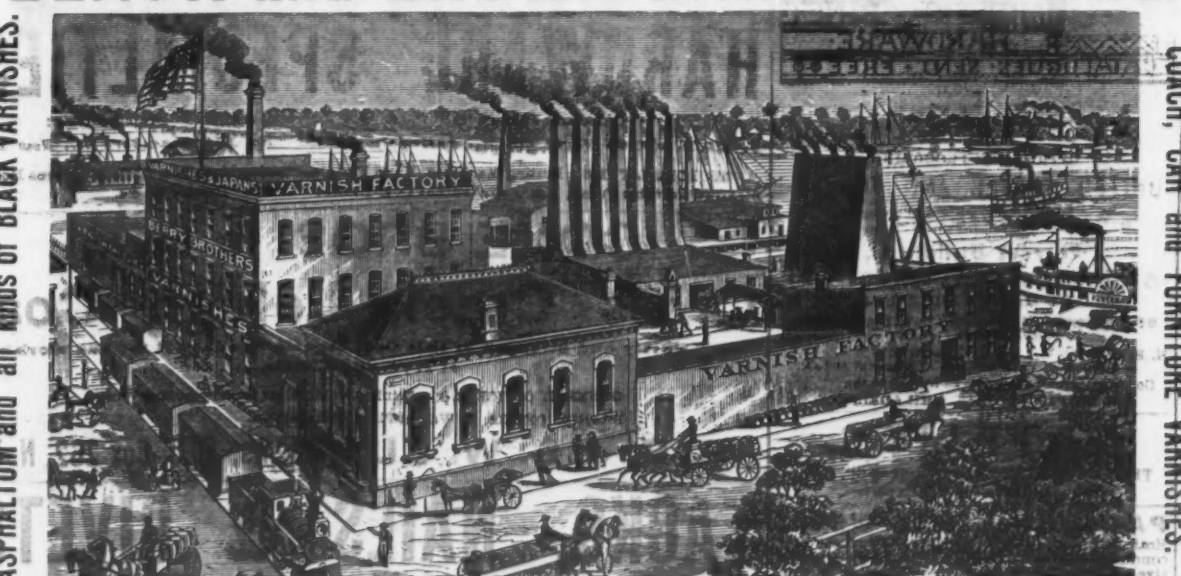
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Bronzing and Lacquering Metals.

The general plan in use in England is thus described: The process of dipping, bronzing and lacquering is simple enough in itself; but, like all other things, it requires a little practice and care. There is a little difference in getting up old and new work. I shall therefore divide it into sections—First, old work, viz., work that has been lacquered before; second, new work. In the first place, where work has been lacquered or bronzed before, the first thing to do is to remove the old lacquer. If this is not done, the dipping acid will have no effect; and the best way to do is to boil the article for half an hour in strong soda water, or any other strong alkali. When the old lacquer is all removed, it will present a dull grayish-black appearance. Then immerse the article for about one hour in a solution of one part of vitriol and five parts water. Soft water must be used, either rain or river; the ordinary tap-water from the companies' mains will not do. Next prepare for the dipping proper, viz., get some strong nitric acid, sufficient to well immerse the article to be dipped, and bear in mind both these acids must be kept in earthenware pans or small tanks; also have a box full of boxwood sawdust, perfectly dry and clean. None other will do. Having all ready, take the article from the pickle of vitriol with a pair of brass pliers, or anything of brass or copper to answer the same purpose. Give it a swirl in the soft water to free it from the acid; then dip the article at once into the nitric acid. A sort of thick green foam will form on it. When you see this, remove it at once, give it a good swirl in the soft water reserved for this purpose, and at once plunge into the boxwood sawdust, and work well about by rubbing it with the sawdust, taking care not to touch it with the hand. When quite dry, take the article from the sawdust and proceed to lacquer it; and the best way to do this—that is, for small articles—is to lay them on the top of a stove, or anywhere where they will get hot enough to take the lacquer. The article must not be too hot, or it will blister the lacquer and spoil the work. When hot enough—and a very little practice will tell you how to know this—paint the article over evenly and carefully with the lacquer. It will dry at once, and if there are any parts to be relieved by burnished portions, this may be done by using a smooth steel burnisher, using a little small beer to wet the burnisher and keep it from cutting the brass. The burnisher must be kept bright and clean by occasionally rubbing it with a little fine emery cloth. If it (the burnishing) is properly done, it will present the appearance of fine gold work. When the part is burnished, lacquer as before. In large work, such as cornice poles, &c., it is impossible to get them hot enough by a stove. They are therefore heated either by passing a jet of steam through them or by filling with boiling water. The best way, where it can be done, is to pass a jet of steam through the tube or article to be lacquered. A very good boiler is used for this purpose. The ends of the tube are closed up, leaving a small hole at one end to allow the steam to escape from. When hot enough, go quickly over it with the lacquer, using a fine camel-hair brush for the purpose. In lacquering the article, if a very pale gold color is wanted, the palest lacquer is the best to use; but if a deep color is wanted take a portion of the pale lacquer and add to it about as much dragon's blood and turmeric powder as will cover a shilling (this is enough for a quarter of a pint), and put it in a warm place for a day or two, shaking it occasionally. It will then be fit for use. Any degree of color may be obtained by altering the quantity—more turmeric if wanted lighter, and vice versa. I do not give any recipe for making lacquer, because it can be bought much cheaper and of a better quality than any amateur can make it.

The Southern Iron Trade.

Col. S. B. Lowe, dealer in metals and Southern manager for *The Iron Age*, furnishes the following statistics of the iron business of Chattanooga for the year ended November 1, 1879:

| | | |
|--|-------|---------|
| Pig iron..... | tons. | 7,338 |
| Iron rails..... | tons. | 10,317 |
| Steel rails..... | tons. | 1,484 |
| Merchant bar iron..... | tons. | 7,550 |
| Nails..... | kegs. | 57,300 |
| Railroad spikes..... | kegs. | 2,310 |
| Railroad track bolts..... | kegs. | 905 |
| Iron ore used..... | tons. | 16,308 |
| Coal used in the manufacture of iron..... | tons. | 93,000 |
| Coke used in the manufacture of iron..... | bush. | 500,035 |
| Pig iron received by river..... | tons. | 8,550 |
| Pig iron shipped direct from this city..... | tons. | 27,389 |
| Pig iron received and shipped, without transfer..... | tons. | 19,050 |
| Coke received and shipped, without transfer..... | bush. | 165,000 |

This covers about two months of the time since the improved demand set in, which has increased both prices and the volume of products.

The increased product of various articles in the district of which Chattanooga is the center and main market, may be indicated by the manufacturing news from different quarters. There are now ready to be blown in, or will be soon, the following furnaces in Alabama and Georgia, which have long been closed:

Round Mountain, cold blast charcoal, 45 x 8 1/2 feet, capacity, 5,000 net tons annually. Cherokee county, Ala.
Cotton Valley, cold blast charcoal, 45 x 8 1/2 feet, capacity, 5,000 net tons annually. Cherokee county, Ala.
Cedar Bluff, cold blast charcoal, 45 x 8 1/2 feet, capacity, 5,000 net tons annually. Cherokee county, Ala.
Sandywell, cold blast charcoal, annual capacity, 5,000 net tons. Stonewall, Ala.
Etna, 45 x 8 1/2 feet, cold-blast charcoal; capacity, 5,000 net tons annually. Polk county, Ga.
Bartow furnace, in Bartow county, Ga., on the W. & A. road, capacity 5,000 tons yearly; will be blown in as soon as arrangements can be made for fuel.

In addition to the 20,000 tons to be produced by the above referred to furnaces, there are at least ten new furnaces building in Alabama; one, Oakdale, being overhauled and gotten ready to blow in Tennessee; and several new ones contemplated in the last-named State. It would hardly be stating it too high to predict that, even if none of the

new plants get into operation this year, the production of pig in the Southern iron and coal region will be double in 1880 what it was in 1879.

There is only one drawback upon this cheerful outlook for the Southern pig iron trade, and that is the present and prospective scarcity of fuel for some months to come. The four furnaces mentioned are ready or about to go to work would use coke if it was to be had. Lacking the cheaper and more productive fuel, they will "make a shift" of charcoal until the other can be obtained. The production of coke and coal has been largely increased, as compared with last year, but still the supply is short and prices rising. A comparative statement of the output of Sewanee mines for November, 1878, and the corresponding month of 1879, shows that in November, 1879, the product was 241,184 bushels coal and 239,352 of coke, a total of 480,536. For November, 1878, it was 117,828 bushels less of coke, and 42,793 of coal, making the total increase 160,621 bushels. Other mines and ovens have been pushed up in their production in about the same ratio, and still there is not enough to supply the demand. This deficiency will soon be supplied, however, as several mines along the Cincinnati road, now about ready for business, will largely manufacture their coal into coke.

The advance in the price of coke is indicated by the statement of the manager of Sewanee Coal and Coke Works here. He reports that the company have closed a contract with the Missouri Furnace Company for 2400 bushels of coke daily at 5 1/2 cents per bushel. The coke to be delivered at Cowan, 87 miles south of Nashville on the N. and C. road. The same company is now filling an old contract with South Pittsburg at 4 cents per bushel, delivered at the furnace.

Protection Against Lightning.

In an interesting article in the *Building World* it is stated that there is in Carinthia a church which was so often struck by lightning that at length it became the custom to close it during the summer months. This continued until, in 1778, the church was rebuilt and provided with a suitable lightning conductor, since which time the building has been struck but few times and has suffered but little damage. It was at one time held that the best way to protect a building was to repel the lightning from it, and as glass is one of the best non-conductors, a thick glass ball was placed upon the top of the spire of Christ Church, Doncaster, England, but in 1836 lightning struck the church, shattering the ball and seriously damaging the spire. The carrying out of a theory which, in this case, proved so disastrous, has had a happier result in the Houses of Parliament, London, where Sir W. Snow Harris, who was charged with protecting the building, carried the flat copper bands which were used for lightning conductors behind the plastering of the walls; and Faraday caused a spiral channel, following the course of the stairs from top to bottom, to be cut in the granite of the lighthouse on Plymouth breakwater, in which was laid a massive copper lightning rod. One of the best instances of what may be called natural protection is afforded by the London Monument. This column, some 200 feet high, is crowned by a bronze flame, which typifies the great fire of London; this flame is in contact with the bars of the iron cage in which it was found necessary to inclose the balcony at the top, to prevent persons from throwing themselves over, and the bars in their turn connect with the rail of the balcony and the hand-rail of the staircase which descends to the ground. It is useless to try to insulate the vane spindle or finial upon a tower or spire by using glass rings; it is better to make this rod the upper part of the lightning conductor. The earth end of a lightning conductor should be carried to continually damp earth or running water, but not to a stone-lined well or cistern.

Wooden Money.

In view of the recent discussion on the money question, the following from the *London Journal of Applied Science* will be of interest:

Advocates of inconvertible paper currency may perhaps derive some satisfaction and encouragement from the fact that from the reign of Henry I down to the establishment of the Bank of England, the legal tender money of England was fabricated out of wood. This instrument was called an exchange tally, and by virtue of it the holder was entitled to receive from the crown the value inscribed thereon. It really consisted of one-half of a four-sided rod or staff, on which, when in entire state, the sum it purported to represent was carved in transverse notches, varying in width for thousands, hundreds, scores, pounds, shillings and pence. These signs were for the unlearned; for the advantage of those who could read, the sum was written in ink on two opposite sides of the staff, and, finally, with a knife and mallet the staff itself was split in two longitudinally. One half, called the tally or check, was given to the person for whose service it was intended; the other half, called the counter tally, was laid up for safe keeping until its corresponding tally should be brought by the person who had last given value to its intrinsic value was, of course, only that of the wood of which it was composed, but by representation it denoted large sums. It was a sort of tally of real money, and served actually to distribute it from man to man by its exchange. From this primitive tally was derived the exchequer bill, first introduced in 1666 by Mr. Montague, the Chancellor of the Exchequer. The word "bill," however, was no doubt obtained from the Norman French word *bole*, which means a staff. Bank post bills and bills of exchange in our own day came from the wooden base, and soldiers are said to this hour to be "billeted" because they formerly lodged in wooden "billets" or tallies, to the victuallers upon whom they were quartered. The olden times officers of the army who were taken into the king's own pay were said to be put on the staff, that is, they were paid with exchequer tallies, or wooden money.

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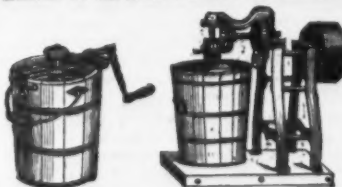
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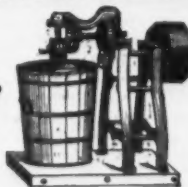
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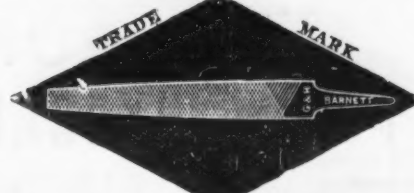
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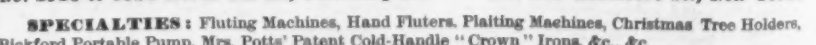
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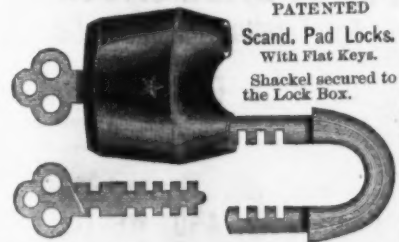
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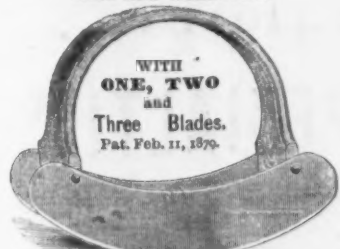


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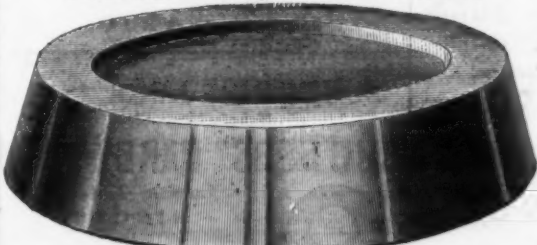
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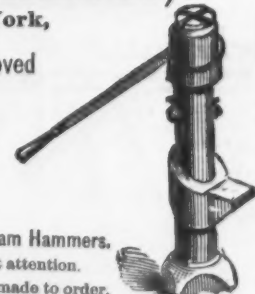
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General Summary of the Trade Mark Laws of the States of the United States.*

BY FRANCIS FORBES.

(Continued.)

In Missouri "An act" (was approved March 6, 1866) "to protect mechanics, manufacturers and others in their trade-marks." It provides that a description of the trade-mark, duly acknowledged, shall be recorded in the office of the Recorder of Deeds of the county where articles to bear the mark are manufactured, and that such record shall be notice to all persons. A second act with same title was approved February 22, 1870. It provides in addition that any person who shall knowingly and willfully forge or counterfeit any representation, &c., of the private label, brand, stamps, wrapper, engraving, mold or trade-mark of any manufacturer, &c., with intent to pass off any goods, &c., to which said forged counterfeit representation is affixed, or in connection with which same may be used as the goods, &c., of such manufacturer, shall be deemed guilty of a misdemeanor and punished by imprisonment in the county jail for a period of not less than three months nor more than twelve months, or fined not less than \$500 nor more than \$5000, or both.

It also provides that any person who shall with intent to defraud, have in his possession any die, plate, brand, engraving, printed label, stamps, imprints, &c., or trade-marks, &c., or any imitation of said marks, &c., usually affixed by any manufacturer, &c., for the purpose of making impressions or selling the same when made, or using the same in connection with any other articles made, &c., by him for the purpose of making impressions or selling the same when made, or using the same in connection with any other article made, &c., and passing the same off upon the community as the original goods, &c., of any other person, or who shall in fact sell or use the same, &c., or who shall wrongfully or fraudulently use the genuine label, &c., or trade-mark with intent to pass off any goods, &c., not the manufacture of the person to whom such label, &c., properly belongs, shall be deemed guilty of a misdemeanor and punished as before stated.

It also provides that any person who shall vend or keep for sale any goods, &c., upon which any forged imitation or counterfeit label, &c., shall be placed, knowing the same to be imitation or counterfeit, shall be deemed guilty of a misdemeanor and punished as before stated, except that the lowest term of imprisonment is one month. He shall also be liable to a civil action to the person whose goods, or whose labels, &c., are imitated or counterfeited for all damages which such person shall sustain, both by virtue of the loss of profits and the damage done to the reputation of the genuine article, &c., and he may be enjoined from doing any of the acts mentioned.

It also provides that any person who, with intent to defraud, shall affix any label, &c., which shall designate any article by any word or words, or by general design, which shall be the same to the eye, or in sound to the ear, as the word or design used to designate goods, &c., of another, shall be liable to the latter in the penal sum of \$500, and for a further sum equal to the amount which the aggrieved party might have received for the same amount of genuine goods, &c., and may be punished by imprisonment in the County jail for a period not less than one month, or more than twelve months. The seizure and destruction of counterfeit trade-marks, and seizure and sale of goods bearing such marks, is provided for.

The General Statutes of Nebraska (1873, p. 758) contain a provision that "if any person shall falsely make, alter, forge, counterfeit, print or photograph, any private stamp, brand, wrapper, label or trade-mark, usually affixed by any mechanic, manufacturer, druggist, merchant or tradesman, to or upon the goods, wares and merchandise, preparation or mixture of such mechanic, manufacturer, druggist, merchant or tradesman."

With intent to damage or defraud any person, &c., or who shall utter or publish, as true and genuine, any such, knowing the same to be false, &c., shall be imprisoned in the penitentiary for any space of time not exceeding twenty years, nor less than one year, and pay a fine not exceeding \$500.

It also provides for the punishment of persons keeping false dies, &c., for the purpose of counterfeiting as above, by imprisonment for not less than six months nor more than ten years, and a fine not exceeding \$1000. "Any person who shall rent, or keep for sale, any goods," &c., "upon which any forged or counterfeit stamps," &c., "or trade-marks shall be affixed and intended to represent the said goods," &c., "as the true and genuine goods," &c., "of any person or persons, knowing the same to be counterfeit, shall be punished by a fine not exceeding \$100."

In Nevada "An act" (was approved March 8, 1865) "concerning trade-marks and names." The registration of the trade-mark or name with the Secretary of State is necessary to obtain advantage of act. For such registration there is a fee of \$20. It is made unlawful for any person, without the consent of the owner of trade mark, to use such mark for the purpose of representing any article to have been manufactured or sold by such owner, or to be of the same kind, character, or quality as his. Any person violating act shall be guilty of misdemeanor and punished by a fine of not less than \$25, nor more than \$500, or by imprisonment in the county jail for not less than five days nor more than thirty days, or both, and he shall be further liable to the party aggrieved for all damages actually incurred, to be recovered as a debt.

Counterfeiting of trade-mark, or using a counterfeit trade-mark, or selling any article bearing a counterfeit trade-mark, filed, &c., knowing it to be such, or having good reason to know it to be such, is unlawful and punishable as above.

Filling old bottles and casks having trade-marks attached, with intent to defraud, is a misdemeanor and punishable as above.

* Prepared for the United States Trade Mark Association.

"Every person who shall knowingly aid or abet, or counsel in or procure the commission of any offense which is by this act made a misdemeanor, shall be held to be guilty of a misdemeanor," and punished as above.

Trade-marks may be transferred like personal property, and shall be entitled to same protection as personal property. Courts may restrain by injunction any use of trade-marks in violation of act.

The Revised Statutes of the State of New Jersey (1877) contain the following section under the title "Crimes," viz.: "Every person who shall knowingly and willfully forge or counterfeit, or cause or procure to be forged or counterfeited, upon any goods, wares or merchandise, the private stamp or label of any mechanic or manufacturer, with intent to defraud the purchasers or manufacturers of any goods, wares or merchandise whatsoever, or who shall vend any goods, wares or merchandise, having thereon any forged or counterfeited stamps or labels, purporting to be the stamp or label of any mechanic or manufacturer, knowing the same to be forged or counterfeited, without disclosing the fact to the purchaser, shall upon conviction be deemed guilty of a misdemeanor, and shall be punished by imprisonment in the county jail not exceeding six months, or by fine not exceeding \$100."

In New York "An act" (was passed April 17, 1862) "to prevent and punish fraud in the use of false stamps, brands, labels or trade-marks." It provides that any person who shall knowingly and willfully forge or counterfeit any representation, &c., of the private stamp, brand, wrapper, label or trade-mark usually affixed by any manufacturer, &c., or cause same to be done with intent to pass off any work, goods, &c., as the work, goods, &c., of such manufacturer, shall be deemed guilty of a misdemeanor, and punished by imprisonment in the county jail for a period of not less than six nor more than twelve months, or fined not more than \$5000.

It also provides the same punishment for any person who shall with like intent have in his possession any die, plate, brand, engraving or printed label, &c., or imitation of same usually affixed by any manufacturer, &c., to articles made by him for the purpose of making impressions or selling the same when made or using same upon any article, and passing same off upon the community as the original goods, &c., of any other person; or who shall fraudulently use the genuine stamp, &c., or trade-mark with intent to pass off any spurious goods, &c., as genuine.

It also provides that any person who shall vend or keep for sale any goods, &c., upon which any forged or counterfeit stamps, &c., shall be placed, knowing the same to be counterfeit, shall be deemed guilty of a misdemeanor and punished by a fine not exceeding \$500, and shall also be liable in a civil action to a person whose goods, &c., are counterfeited or whose trade-marks are forged, for all damages such person may sustain by means of any of the acts mentioned, and may be restrained by injunction.

It also provides the same punishment for any person who shall, with intent to defraud, knowingly affix or cause to be affixed to any bottle, can, box or package containing any goods, &c., any stamps, &c., which shall designate the goods by a word or words which shall be the same, wholly or in part, to the eye or in sound to the ear, as the words used by any other person to designate his goods, or shall knowingly sell or offer for sale any such bottle, &c., with such stamp. He shall also be liable to the party aggrieved in the penal sum of \$100 for each offense.

In 1875 and 1878 statutes were passed which are given in full: "An act to protect the owners of bottles, boxes, baskets, casks and syphons used in the sale of soda waters, mineral waters, porter, ale, cider, ginger ale, small beer, lager beer, white beer, or other similar beverages." Passed May 14, 1875.

Section 1.—All persons and corporations engaged in the manufacture, bottling, packing in boxes, baskets or casks, or in the sale of soda waters, mineral waters, porter, ale, cider, ginger ale, small beer, lager beer, white beer, or other similar beverages in syphons or bottles packed in boxes, baskets or casks, or unpacked with their name or names, or pressed or otherwise produced upon such bottles, syphons, boxes, baskets, casks, or upon the faucets, stoppers, corks or other thing connected therewith or appertaining thereto, may file in the office of the clerk of the county in which the principal place of business of such person or persons or corporation is situated, and in the office of Secretary of State, a description of the names and marks so used by them respectively, and cause such description to be published once in each week for three weeks successively in such county, except the city and county of New York and the city of Brooklyn, in the county of Kings, where each publication shall be made for the same time (Sundays excepted) in two daily newspapers published in the cities of New York and Brooklyn respectively.

Section 2.—It is hereby declared to be unlawful for any employee, corporation, person or persons hereafter, without the written consent of the person, firm or corporation, as owner thereof, to fill with soda water, mineral water, porter, ale, cider, ginger ale, small beer, lager beer, white beer or other beverages any such syphon or bottle so marked, or to deface, file off, turn off or by other means obliterate or efface the names, marks or devices thereon, with intent to sell, or to sell, dispose of, buy or traffic in any such syphons, bottles, boxes, baskets, casks, faucets, stoppers, corks or other thing connected therewith or appertaining thereto, so marked, branded, stamped, engraved, etched, blown, impressed, or otherwise produced thereon, and not bought by him, her, then or it of such owner thereof. Any person or corporation offending against the provisions thereof shall be deemed guilty of a misdemeanor, and shall forfeit to the party aggrieved a sum not exceeding \$25 for each and every offense.

Section 3.—The fact of any other person than the rightful owner, without such written permission as aforesaid, using such syphons, bottles, boxes, baskets, casks, faucets, stoppers, corks or other thing connect-

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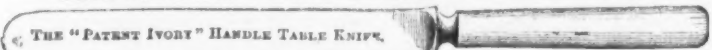
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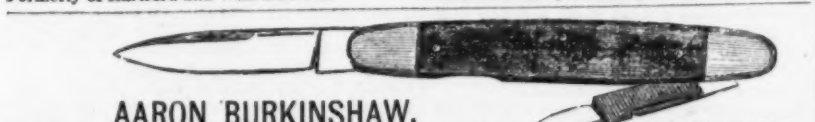
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It is a decided improvement in large
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For Railroad Switches, Freight Cars, and the Hard-
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These shears are unsurpassed for cheapness, dura-
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Fulcrum 1 1/2 inch
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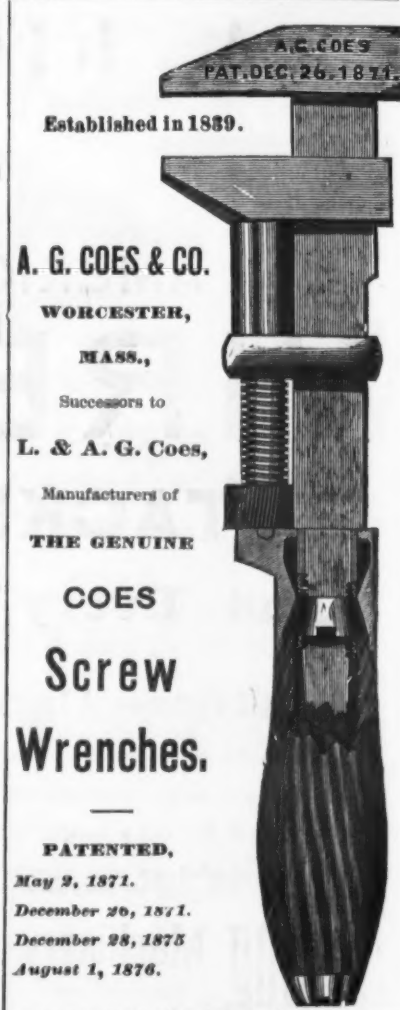
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The backstrain when the wrench is used is borne
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The strongest Wrench made, and the only suc-
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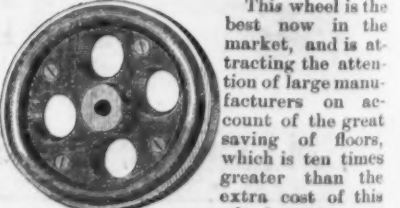


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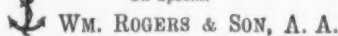
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Son of the late Wm. Rogers.
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Our Knives are guaranteed to STRIP 12 dwts. of Silver per Dozen. All goods are put up ONE DOZEN in a box. All our Knives are put up in the latest and most attractive style, with guarantee card in every box.



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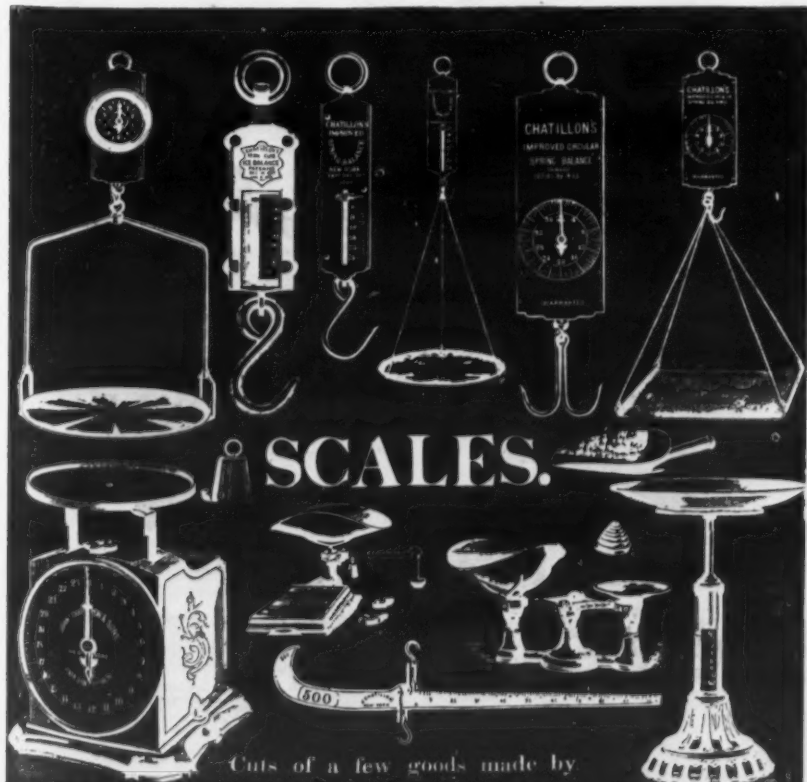
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(See Monthly Iron Age.)



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The rapid increase in the use of Nickel-Plating owing to the introduction of the Weston Machine and the very low price of nickel material, enables us to give greatly reduced estimates for complete outfits.

We are furnishing outfits specially adapted for Stove Work, giving a pure white deposit on plain or metal surfaces.

Outfits complete, with Dynamo-Electric Machine Tanks, Anodes, Solution, &c., &c., \$250.

We beg to refer to the following Stove Manufacturers among 500 other houses using the Weston Machine: Richardson & Boynton, S. S. Jewett & Co., Fuller, Warren & Co., Perry & Co., Detroit Stove Works, Michigan Stove Co., Cooperative Stove Co., E. & C. Gurney, Hamilton & Toronto, and many others.

INFRINGEMENTS. We call attention to infringements of the Weston Machine, in which Automatic Switches are used to pre-vent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

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ed therewith or pertaining thereto, or having the same in his, her, their or its possession with intent to sell or for the sale therein or thereby of any soda water, mineral water, porter, ale, cider, ginger ale, small beer, lager beer, white beer or other similar beverage, and any such owner or the agent of such owner who shall make oath or affirmation before any magistrate that he has reason to believe and does believe that any of such syphons, boxes, baskets, casks, faucets, stoppers, corks or other thing connected therewith or appertaining thereto, belonging to him, them or it, marked, branded, stamped, engraved, etched, blown, impressed or otherwise produced thereon and registered as aforesaid, are being unlawfully used by any corporation, person or persons, selling or manufacturing soda water, mineral water, porter, ale, cider, ginger ale, small beer, white beer or other similar beverages, or that any junk dealer, manufacturer or vender of bottles, boxes, baskets, casks, faucets, stoppers or corks secreted upon his premises, or in any other place, or is or has become unlawfully possessed thereof, or has defaced, filed off, turned off, or by other means obliterated or effaced the names, marks or devices thereon or on any of the same with unlawful intent, then the said magistrate shall thereupon proceed to obtain the same under the existing provisions of law in relation to search warrants, which are hereby declared to fully relate to the purposes of this act.

Section 4.—All acts and parts of acts inconsistent herewith are for the purpose of this act hereby repealed.

Section 5.—This act shall take effect immediately.

"An act supplemental to chapter three hundred and six of the laws of eighteen hundred and sixty-two, entitled An act to prevent and punish fraud in the use of stamps, brands, labels or trade marks." Passed June 8, 1878.

Section 1.—Any person or persons who, with intent to defraud or to enable another to defraud any person, shall manufacture or knowingly sell, or cause to be manufactured or sold, any article or articles marked, stamped or branded, or enclosed or enclosed in any box, bottle or wrapper having thereon any engraving or engravings, or printed labels, stamps, imprints, marks or trade-marks, which article or articles are not the manufacture, workmanship or production of the person named, indicated or denoted by such marking, stamping or branding, or by or upon such engraving or engravings, printed labels, stamps, imprints, mark or trade-mark, shall, upon conviction thereof, be deemed guilty of a misdemeanor, and for such offense shall forfeit and pay a fine of \$100, to be recovered with costs in any of the courts of this State having cognizance thereof in an action to be prosecuted by the District Attorney in the name of the people, and the one-half of such recovery shall be paid to the informer and the residue shall be applied to the support of the poor in the county where such recovery is had.

Section 2.—Any person or persons who, with intent to enable another to defraud any person, shall manufacture or knowingly sell or expose for sale or offer to sell or have in his or her possession, with intent to sell, any article or articles marked, stamped or branded, or enclosed or enclosed in any box, bottle or wrapper, having thereon printed, marked, stamped or engraved any word or words, sign or signs indicating or denoting or purporting to indicate or denote the quality, grade or character of such article or articles, which do not truly indicate, denote or represent the quality, grade or character of such article or articles, shall, upon conviction thereof, be deemed guilty of a misdemeanor, and for each such offense shall forfeit and pay a fine of \$100, to be recovered, with costs, in any of the courts of this State having cognizance thereof, in an action to be prosecuted by the District Attorney, in the name of the people, and the one-half of such recovery shall be paid to the informer, and the residue shall be applied to the support of the poor in the county where such recovery is had.

Section 3.—This act shall take effect immediately.

(To be continued.)

Decision in the Bit Stock Litigation.

A decision of interest to the hardware trade has been rendered by Judge Lowell, in the United States Circuit Court of Massachusetts, in the case of the Millers' Falls Company vs. Quimby S. Backus, rendered December 12th. The following is the text of Judge Lowell's decision:

The plaintiffs are the owners of the reissued patent, No. 6350, dated March 23, 1875, granted to them upon an invention of Charles H. Stockbridge, their assignor. The original patent, dated February 10, 1867, is not in evidence; I understand that the specification was identical with that of the reissue with the exception of the claim.

The invention relates to an improvement in the stocks or braces for bits and other tools. The specification and drawings show a socket with the usual rectangular cavity for receiving the shank of the tool; upon the outside of the socket is a screw; a nut, sleeve or shell screws on to the socket, and beyond the screw is a continuation of the nut, which contains two dogs, one on each side, and having the ends nearest the socket, free to move inward. The end of the socket nearest the nut consists of an annular cam, or inverted hollow cone. When the dogs touch the walls of this cam, they are forced inward and come under the shoulder of the shank of the tool which has been placed in the socket, and help to hold it fast.

The defendant says that the dogs are intended to act merely as checks or wedges to engage the shoulder of the tool and prevent its being pulled out; while the complainants insist that the dogs grasp or gripe the round part of the tool and hold it by the force of the gripe as well as by checking the shoulder, and that their holding power

does not depend upon their being directly under the shoulder.

The specification is somewhat uncertain upon this point. In one place it speaks of the "grasping ends" of the dogs, and in another, of the tool as being locked or fastened in the socket because the ends of the jaws come under the shoulders of the shank of the bit and prevent its withdrawal.

I am satisfied that the dogs do or may act in fact as grasping devices; both experts speak of them as such, and the model or specimen, which is admitted to be made after the pattern of the specification, will operate in that way. The plaintiffs must have the advantage of the fact in the decision of the questions which depend upon it.

Before the time of Stockbridge's invention Draper and Parker had taken out patent No. 48,763, upon an invention of W. W. Draper, and it is understood that the defendant now owns this patent. The bit brace of Draper consisted of a socket provided with a screw, and next above the socket, that is, nearer the hand of the operator, was a cone; a nut was adapted to screw on to the socket, and on each side of the middle of the nut, outside of it, were, loosely pivoted by their middle, two pieces of iron which may be called dogs or jaws, much longer than the nut, and which met, or might meet, or nearly meet, below the lower end of the nut. When the nut was screwed upon the socket, the upper ends of the dogs or jaws were forced apart by passing over the cone, and thus the lower ends were forced together and surrounded the tool just below the shoulder and held it in place.

A question was raised concerning this invention precisely like that in respect to Stockbridge's, whether the jaws can grasp the tool or only act on the shoulder. Here again I am of opinion that the jaws are capable of grasping some tools, and might, without invention, be made to grasp a great variety of sizes of tools, and therefore this invention of Draper would anticipate that of Stockbridge, if the claim of the latter should be broadly construed.

The claim of Stockbridge is: "The combination of the socket F, having cams b b, and a nut B, provided with dogs C C, substantially as and for the purpose set forth." The cams here referred to are sections of the annular cam.

It is admitted by the plaintiffs that, in the existing state of the art, his claim must be limited to substantially such a nut and other elements as are described. The defendants admit that he may claim something, but only on the theory that his dogs or jaws serve to check the shoulder of the tool inserted in the socket; if constructed to extend to jaws which grasp the tool, they say it is anticipated by Draper.

The defendant has organized on the inside of a nut or sleeve a pair of grasping jaws which work like those of Draper, and has patented this form of brace. The question, therefore, is a very material one, whether, since Stockbridge's patent is held by me to be for a grasping as well as checking contrivance, it is valid.

Mere change in the form and proportions of a known instrument or machine, however great, will often be held to be merely colorable or unessential. The inquiry is, whether that indescribable quality called invention has been employed in making the change. The Stockbridge brace appears to be more compact, more convenient to handle, and altogether better for use in the ordinary work for which it is designed than that of Draper; and the change is so great, especially in the nut or sleeve, that it cannot, in my opinion, be called a mere constructive modification. The plaintiffs may therefore claim such a nut as Stockbridge describes, with the grasping dogs or jaws placed inside the nut or sleeve, and forced into their final position by the annual incline, called in patent the cams b b.

The defendant has reversed the action of the cone or incline at the end of the socket, so as to press apart the upper ends of the dogs, and thus to force together their lower ends. This seems to me to be a formal or colorable variation, or, if that expression is too strong, an obvious change of construction not affecting the combination in its essence. Although the jaws, by themselves considered, are the invention of Draper, they cannot be substituted for the dogs or jaws of Stockbridge on the inside of his nut or sleeve without infringing his combination. This depends upon the simple but material question of fact, whether Stockbridge's dogs act as grasping jaws, which I have already said I find them to be.

Decree for the complainants.

INDUSTRIAL ITEMS.

MASSACHUSETTS.

Orders for 1500 portable engine "pop" valves have just been received by the Consolidated Safety Valve Company. This company was organized in Boston during the present year, having purchased all the patents relating to steam safety valves which had been granted to E. H. Ashcroft, of Boston and G. W. Richardson, of Troy. The new company have 35,000 of their valves in use. They have been adopted by the government after a severe test, and are in use upon leading railways in the country. The company are now making sixteen three-inch nickled-seated pop valves for the government.—Boston Daily Advertiser.

The Old Colony Railroad has bought of the Fall River Iron Works a lot of real estate at Fall River, including Steamboat and Lindsey's wharves, for \$280,000.

The Rodney Hunt Machine Company, of Orange, have largely increased their business the present year, and have been engaged upon several large and important contracts. Among others they have built and put in two of their improved turbine water wheels for Governor Talbot, at his mill at North Billerica.

The Fitchburg Machine Works have commenced running 13 hours per day.

The wire mills at Spencer are running 14 hours per day.

The Atlantic Car Works at Salem, which

H. D. SMITH & CO.,

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Treasurer.

J. W. LYNDE, Secretary.

PLATTSBURG, N. Y.

STERLING & CO., Agents, 7 and 9 Cliff Street, New York.

METALLIC AMMUNITION,

Rim and Central Fire, all Sizes.

GUN WADS, Black and Pink Edge,

Guaranteed Superior to any Imported.

THE UNION METALLIC CARTRIDGE COMPANY,

BRIDGEPORT, CONN.



PRICE LISTS WITH DISCOUNTS TO THE JOBBING TRADE ON APPLICATION.

PERCUSSION CAPS.

F. C. Trimmed Edge, W. Proof.
F. L. Ground Edge, W. Proof, Foil Lined, equal to any imported.
D. W. P. Ground Edge, W. Proof, Central Fire, equal to any imported.
Musket, Paper and Tin Boxes.
Berdan, Orcutt and Wesson Primers.
Bullet Breech Caps.

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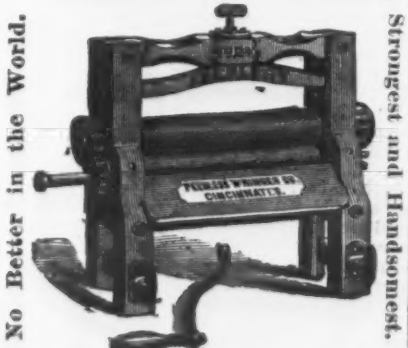
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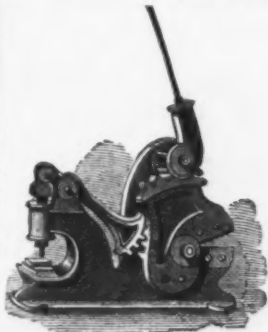
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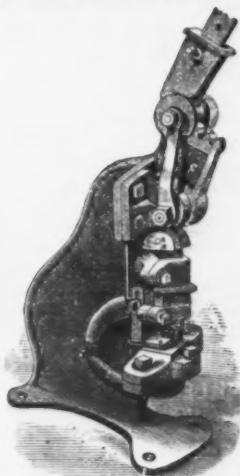
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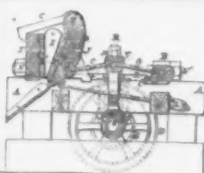


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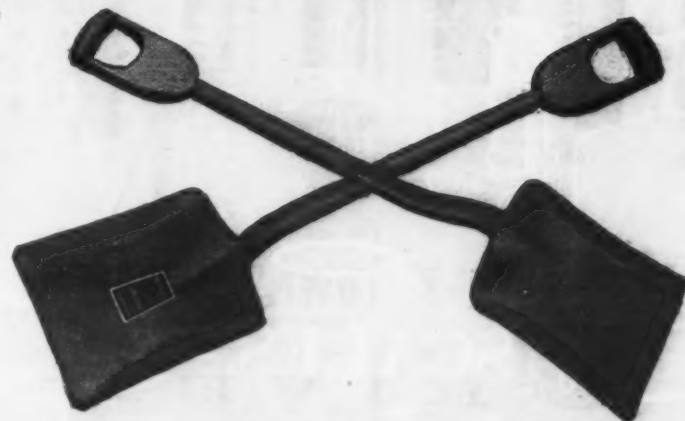
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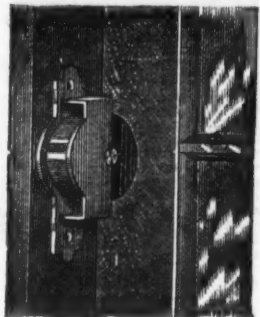
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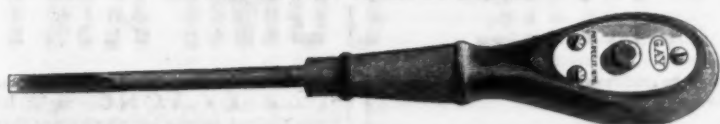
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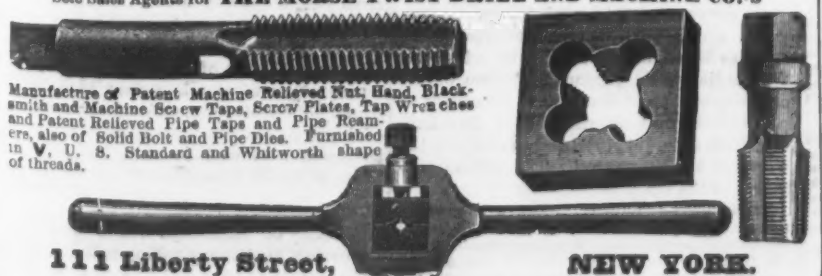
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also all kinds of Handles, Sledge, Chisel and Hammer
Handles. Also

COTTON AND BALE HOOKS,
Patented Feb. 13, 1877; a new combination of Hooks.
456 E. Houston St., New York City.

for several years have been idle, started up week before last.

By a vote of the stockholders, the Hartford Foundry and Machine Company will wind up its business January 31, 1880, and offers its large stock of tools for sale.

CONNECTICUT.
F. J. Obert shipped from his Union Boiler Works, Reading, 104 tons of finished tank and boiler work during November, this being the largest shipments he ever made in one month since the establishment of his boiler works. He paid \$3700 to his employees for November.

Bradley & Co., Empire Chain Works, 816 Richmond street, Philadelphia, are making several sets of heavy chain cable for John Roach & Sons, shipbuilders, New York.

Messrs. A. Whitney & Sons have recently made shipments of car wheels to South America and England.

J. Barton Smith & Co., manufacturers of files and rasps, Philadelphia, are very busy and behind orders three months. They are building a new three-story shop, which they expect to occupy by the 1st of January next. The market for their files is mostly in the West, while their shoe rasps are distributed among all the States by the large shoe finding houses of Boston and New York.

Messrs. Mellert were the successful bidders for the 25 tons of iron pipe sold by the city of Reading last week. Price received was \$20 per ton, to be delivered by the city.

The Philadelphia Bridge Company, Pottstown, have received orders for three large iron turntables for the Shenandoah Valley Railroad Company.

The Stewart Furnace No. 2, Sharon, made 378 gross tons Bessemer pig for the week ending December 6, ranging in grade from No. 1 to 3.

The blowing-in of the Shenango Furnace No. 2, at Middlesex, on Friday, the 5th inst., makes a total of 14 furnaces in blast in the Shenango Valley, with prospects of four more being added to the list before the close of next January.

Yeager, Boyer & Co., boiler makers, Reading, have 15 hands out nearly all the time in making repairs to steam boilers in different parts of Berks County.

Adam Johnson & Son, proprietors of the Franklin Iron Works and car shop, Reading, this week commence to build a number of iron ore cars for Clymer & Co., and also a number of cars for the East Penn Iron Co., whose furnaces are located on the line of the East Penn Railroad. Only a few weeks ago a number of cars were built for the East Penn Iron Co. at these works. A great deal of hot blast pipe is also being made at this establishment.

Week before last Messrs. Atkins Bros. started up the Port Carbon Rolling Mill, which they have leased. About 100 men are employed. The mill is running to its full capacity on puddled bar of the best quality, which is used in Messrs. Atkins' beam and guide mill at Pottsville.

PITTSBURGH AND VICINITY.

Henry Lloyd, Son & Co., on the 8th, started their guide mill on double turn. They are erecting 4 more puddling furnaces.

The Beaver Falls Car Works are filling an order of 100 coke cars for the Lake Erie Railroad at the rate of 20 per week.

The cutlery works at Beaver Falls are exceedingly busy just at present on orders. It is thought that it will be necessary to make additions to the scissors department of the works.

Zug & Co., have put their bar mill on double turn, being the first time for several years.

The Edgar Thomson Steel Co. turned out, in the month of November, more Bessemer steel rails than any other rail mill in the country during that month.

The Ward Furnace at Niles, which is about torn down, has been purchased by H. O. Bonnell, of Youngstown, for the Mahoning Valley Iron Company, who will remove it to that place and immediately commence repairs. It is expected to begin blast in February.

The Jefferson Iron Works, at Steubenville, are still behind their orders for nails.

Belfont Furnace, Ironton, went into blast on Monday, the 8th inst.

The Youngstown News says: "The Hall Iron Company, operating the Hubbard Rolling Mill, are running the works double turn, filling a large order of nut iron for the Cleveland Nut and Bolt Works."

OHIO.
The Burgess Iron and Steel Works, at Portsmouth, had a break down of their small mill recently, which caused considerable delay in filling some pressing orders for steel. They have put in a new mill, and the entire works are running full, with heavy orders ahead of their present capacity. They are supplying the Taylor Hoe and Tool Works, at Ironton, with a fine quality of steel.

The Works of Lambert & Gordon, at Ironton, are running full with several large orders to be filled early, and with a prospect of heavy orders for machinery during the present year.

The new Siemens-Martin furnace of the Portsmouth Iron and Steel Company, at Portsmouth, has been making a very successful run since the fire was first lighted, and is now turning out 20 tons steel ingots per day in two heats. The company have a good supply of stock, and are preparing for a vigorous run of all departments of the works through the next year. They are making homogeneous steel boiler plate and rivets; also agricultural steels and steel tires. The steel department of these works is being put in complete order as rapidly as possible. The puddling and muck bar departments are running full double turn, and the mills full single turn, with overtime. The rolling mills are being put in good condition, and new machinery is being added. They are now turning out muck bar, boiler plates (steel and iron) hoop and sheet iron, spikes, rivets, track bolts, fish bars, T and angle iron and small T-rails. The steel furnace is making steel ingots of various shapes and sizes, suitable to all grades and shapes of steels required. A sample of steel made from their steel flanging stock, and bent cold (quadruple) under a heavy hammer, shows a wonderful tenacity, having the appearance of having been hot welded; it exhibits a quality neither hot nor cold-short, and no fracture of the steel is noticeable.

After the 1st of January next the capacity of the Alice Furnace, at Ironton, is expected to be 500 tons per week, with the use of one-quarter Quinnemont coke, one-quarter Ashland (Ky.) coal and half Connellsville coke and all native ore. The furnace has recently received 1000 tons Virginia hematite and 500 tons Crawford ore, to be used as mixtures. The Aetna, Bellefont and Sarah furnaces are about to agree upon an increase of 15 per cent. in wages. The Blanche, of the Aetna twins, still stands idle, and is not expected to be put in blast during the coming year.

The Tyler Hoe and Tool Works, at Ironton, went into operation recently and ran three days, when they were compelled to shut down, in consequence of the failure of a stock of steel to arrive in time to enable them to continue through the week. They will, however, receive a shipment of steel from the Burgess Iron and Steel Works, at Portsmouth, and the works will run full from that time. The machinery is complete and furnishes a capacity for the manufacture of 75 to 100 dozen Tyler hoes per day. They will, however, turn out only about 50 dozen per day for the first few weeks. The new steam hammer which they are putting up will give them quite an increased capacity.

KENTUCKY.
The Bellefont nail mill and furnaces, at Ashland, are working busily. The Bellefont Nail Works are shipping large quantities of nails South and elsewhere, to fill orders for immediate consumption.

Iron Hill Furnace, after undergoing repairs for three weeks, commenced making iron on Monday, the 8th. This furnace has 250 loads of charcoal on hand, with 400 more to come in. The furnace is running on one-half Lambert and one-half Tophill and Limestone iron ore.

The Norton Iron Works is running full time in all of its departments. The furnace made her first cast since the accident on Thursday evening, 4th inst. She is now working well and making good iron. The rolling mill and nail mill are running to their utmost capacity. Both the factory and the rolling mill had to suspend operations on Friday and Saturday, the 5th and 6th insts., on account of there being no iron. The factory is turning out about 5000 kegs of nails per week, and they are being shipped nearly as fast as they are packed.

The Mt. Savage Furnace is averaging 13½ tons of foundry iron per day, and is preparing for another blast based on 11,000 cords. There are about 1500 tons of iron ore on hand, and more is coming in at \$2.50 per ton, delivered.

The Ashland Furnace is working finely, making an average of 42 tons of No. 1 iron per day. The furnace recently made nearly 47 tons of iron per day for three days. Nearly 1000 tons of iron left their landing on Monday, the 8th inst. The Lexington and Big Sandy Railroad are running two coal trains. The coal trains make three trips per day, bringing in about 60 cars per train per trip.

The rebuilding of the Pennsylvania Furnace, which was lately destroyed by fire, will not commence before spring.

MARYLAND.
It is said that nearly 40 car loads of old rails have arrived at the Cumberland rolling mill within the past two weeks.

VIRGINIA.
There have been some changes made in the management of the Pennsylvania and Virginia Iron and Coal Company. John F. Hartranft is president, R. N. Pool, vice-president, and J. F. Lewis, second vice-president and general manager.

WEST VIRGINIA.
Messrs. R. T. Harvey & Co., dry-goods merchants, of Huntington, are laying in a stock of heavy and light hardware. They will do a jobbing and retail business.

INDIANA.
The new Albany Steam Forge, of New Albany, was organized in 1869, with but one hammer, and since that time they have been obliged to increase their capacity by the erection of four additional hammers, making five in all. They are at present running day and night to fill orders. The shipments of car axles from this establishment during the present year aggregate upward of 20,000, besides steamboat and other shaftings, crank pins, piston rods, and all kinds of forgings from steel ingots. These works have lately purchased 500 tons of scrap iron in England, and arrangements have been consummated for further shipments.

MINNESOTA.
The Duluth News states that the Duluth Iron Company, recently incorporated, are actively preparing to go into operation with their blast furnace, which was built in the year 1873 and 1874 by a stock company, at a cost of some \$160,000, and, with the exception of sufficient kilns, was ready for business in the latter year. The city of Duluth gave \$30,000 in bonds, and Jay Cooke & Co. and E. W. Clark & Co. were heavy stockholders. The property finally fell into the hands of Capt. Ward, of Pittsburgh, from whom the new company have purchased it. The work contemplated, and which will be pushed as fast as practicable, is the erection of 35 kilns (in addition to the seven now completed) at an expense of \$25,000. Five of them will be erected beside the others on Rice's Point, and the remainder at different places on the St. Paul and Duluth road, Barnum being one probable point. The building of their dock, with the necessary dredging, will cost some \$12,000, two parallel lines of dockage, each 500 feet long, being contemplated, the slip between to be 100 feet wide and dredged to within 100 feet of the stock-house. The work will be piling, to be done this winter, and the 400 feet of present dock will form part of the new. There will be ample room for six vessels to load or unload here. Some \$8000 will be needed for changes, repairs, &c., while for wood and coal \$25,000 will have to be expended before any pig iron is actually turned out. The furnace will go into blast about the 1st of next June, it being impossible to get sufficient ore and limestone here before that date. The ore is to be brought from L'Anse and Marquette in a barge.

The Iron Age

Metallurgical Review.

New York, Thursday, December 18, 1879.

DAVID WILLIAMS, Publisher and Proprietor.
JAMES C. EYLES, Editor.
JOHN S. KING, Business Manager.

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Thirty-third Page.—Boston and St. Louis Hardware and Metal Prices.

The demand for coke for Eastern consumption is far in excess of the ability of the West to supply it. It has been found by experience that coke mixed with anthracite largely increases the output of the furnace, in some cases fully 50 per cent., and though in many places a ton of iron made with such a mixture will cost more than a ton made with anthracite, the profits of a week's or a month's blast, in view of the increased output, will largely exceed those where only anthracite is used. This has stimulated the ability of the ovens to produce. It should be noted, however, that but a small proportion of the ovens have been located with a view to supplying this Eastern trade. The demand has been mostly from the West, and this Eastern demand finds the ovens so placed that but few of them can ship East without being at a heavy expense for freight above those better located with reference to this trade. This renders it difficult to pro-

cure coke for Eastern shipment, and is one reason why such coke is higher nominally than that intended for the West. This extra freight is added to the price at the ovens, and increases the quotation for Eastern coke from 20 to 30 cents per ton.

Duties on Wrought Iron Wrongly Assessed.

The recent Treasury decision concerning steel blooms has induced investigation into cognate parts of the subject, and this research has led to the discovery that the tariff on "iron in slabs, blooms, loops, or other forms," has long been, and is yet, wrongly interpreted and unwarrantably applied. As it stands in the Revised Statutes, the law of the case is as follows:

Bar iron, rolled or hammered, comprising flats not less than one inch or more than six inches wide, nor less than three-eighths of an inch or more than two inches thick; rounds not less than three-fourths of an inch nor more than two inches in diameter; and squares not less than three-fourths of an inch nor more than two inches square—one cent per pound. Bar iron, rolled or hammered, comprising flats less than three-eighths of an inch or more than two inches thick, or less than one inch or more than six inches wide; rounds less than three-fourths of an inch or more than two inches in diameter; and squares less than three-fourths of an inch or more than two inches square—one cent and one-half per pound. But all iron in slabs, blooms, loops, or other forms, less finished than iron in bars, and more advanced than pig iron, except castings, shall be rated as iron in bars, and pay a duty accordingly; and none of the above iron shall pay a less rate of duty than thirty-five per centum ad valorem.

With very trivial modifications of expression, which do not at all change the original meaning, the above provisions are in exactly the same language as when embodied in the act of June 30, 1864. The evident design of the duty of thirty-five per centum ad valorem was that each and every description of iron specified in the whole paragraph should bear, at the very least, that duty on value; and that, if the dutiable value should advance to the point at which the specific duty of one cent, or of one cent and one-half, per pound should be equivalent to less than thirty-five per cent., then, but only then, the ad valorem rate prescribed should be substituted. Plainly the intent of the law was to levy one or other of the two specific duties, as occasion might require, on "all iron in slabs, blooms, loops, or other forms," as stated, except under the contingency which has been pointed out; for, when it is said "shall be rated as iron in bars, and pay a duty accordingly," the duty referred to must be one or other of the specific duties named in the preceding part of the paragraph; else there is no practical application nor descriptive meaning in the word "accordingly." And when it is provided that "none of the above iron shall pay a less rate of duty than thirty-five per centum ad valorem," it is clear that the lowest permissible charge is mentioned, being the unusual or exceptional one; consequently, that a higher charge than this lowest is applicable save in the cases dependent on a given contingency.

This construction of the law is supported by analogous practice in our custom houses. For example, the tariff provides: "Brandy and on other spirits manufactured or distilled from grain or other materials, and not otherwise provided for, two dollars per proof-gallon;" and further: "No brandy, spirits, or other spirituous beverages under first proof shall pay a less rate of duty than fifty per centum ad valorem." Under these provisions and the one that "no lower rate or amount of duty shall be levied, collected and paid, on brandy, spirits, and other spirituous beverages, than that fixed by law for the description of first proof," the usage of appraisers has been to substitute the ad valorem rate of fifty per cent. for the specific duty of two dollars, whenever the latter would be equivalent to less than the former. Other analogous cases might be instanced, all supporting the view above taken.

The wrong construction of the law consists in assessing the "iron in slabs, blooms, loops, or other forms" at a uniform and invariable rate of thirty-five per cent. ad valorem, without any consideration whatever of the superior applicability of one or other of the specific duties named for bar iron, thus making the lowest allowable charge the constant measure of the proper rate or one which is never to be exceeded, notwithstanding that a higher is frequently required by the terms of the statute. An unwarrantable construction consists in an unvarying assessment of the specific duties of one cent and one and one-half cents per pound, without any reference at all to the possible fact that these duties may amount to less than the ad valorem rate, which the law prescribes shall be the very least imposed.

It is a remarkable fact that the iron rated as bars, and uniformly dutied at the ad valorem rate, has been much higher in average value per ton in nearly every one of the ten fiscal years ending June 30, 1878, than the other two classes of bar iron. This is proof that the kinds rated as bars are higher in grade, quality or texture, generally speaking, than the kinds commercially known as bar, or, what amounts to the same thing, that they are more nearly finished and adapted for use as final manufactures. As it is an all-pervading design of the tariff that the more advanced the product the more advanced shall be the duty; and as, on this principle, bar iron is dutied higher than pig iron, the better grades of bar iron higher than those which are inferior, steel higher than bar iron of any

quality, and the better grades of steel higher than the inferior, even analogy alone requires that the iron rated as bar should be assessed at the highest permissible duty which can be applied to bar iron.

These views are fully supported by the comparative exhibits given below, compiled and calculated from the home consumption tables of imports, as annually published by the United States Bureau of Statistics.

TABLE A.

Iron in Slabs, Blooms, Loops or other Forms, Rated as Bars, and Dutied either 35 or 31.5 per cent. ad valorem.

| Years ending June 30. | Pounds. | Foreign invoice values. | Average per ton. |
|-----------------------|-------------|-------------------------|------------------|
| 1869 | 32,721 | \$1,439.77 | \$58.56 |
| 1870 | 18,335 | 837.00 | 45.65 |
| 1871 | 3,930,281 | 100,269.77 | 25.50 |
| 1872 | 352,203 | 10,940.58 | 31.07 |
| 1873 | 56,143,342 | 1,061,818.05 | 18.72 |
| 1874 | 33,548,248 | 2,050,734.91 | 61.01 |
| 1875 | 3,615,919 | 307,899.60 | 83.26 |
| 1876 | 45,381,482 | 1,639,419.01 | 36.12 |
| 1877 | 31,073,774 | 919,479.80 | 29.59 |
| 1878 | 2,569,194 | 93,599.00 | 36.40 |
| 1879 | 15,053,000 | 474,777.00 | 31.55 |
| 1880 | 840,300 | 37,673.00 | 44.82 |
| 1881 | 5,431,899 | 200,912.00 | 36.85 |
| Total | 225,833,439 | \$7,898,759.51 | \$78.35 |

* Imported under duty of 35 per cent. ad valorem.

† Imported under the 10 per cent. reduction of duty, or 31.5 per cent. ad valorem, provided for in the act of June 6, 1872, and going into effect August 1, 1872.

NOTE.—The 10 per cent. reduction of duty was repealed by act of March 3, 1875, taking effect from and after its passage.

TABLE B.

Bar Iron Dutied 1.5 or 1.35 Cents per Pound.

| Years ending June 30. | Pounds. | Foreign invoice values. | Average per ton. |
|-----------------------|------------|-------------------------|------------------|
| 1869 | 15,298,871 | \$145,724.86 | \$50.60 |
| 1870 | 12,879,535 | 295,428.29 | 23.18 |
| 1871 | 32,150,000 | 226,258.59 | 7.05 |
| 1872 | 10,000,395 | 271,138.54 | 27.11 |
| 1873 | 323,450 | 9,020.98 | 28.02 |
| 1874 | 6,735,869 | 224,623.71 | 33.34 |
| 1875 | 2,070,978 | 70,351.58 | 33.97 |
| 1876 | 32,150,000 | 1,150.00 | 77.71 |
| 1877 | 920,894 | 30,444.15 | 33.08 |
| 1878 | 987,327 | 31,523.34 | 31.93 |
| 1879 | 70,800 | 2,118.00 | 30.04 |
| 1880 | 70,800 | 2,118.00 | 30.04 |
| 1881 | 1,730,083 | 50,000.00 | 28.88 |
| Total | 62,966,145 | \$1,631,137.01 | \$58.03 |

* Imported under duty of 1.5 cents per pound.

† Imported under the 10 per cent. reduction of duty, or 1.35 cents per pound, provided for in the act of June 6, 1872, and going into effect August 1, 1872.

NOTE.—The 10 per cent. reduction of duty was repealed by act of March 3, 1875, taking effect from and after its passage.

TABLE C.

Bar Iron Dutied One Cent or Nine-Tenths of a Cent per Pound.

| Years ending June 30. | Pounds. | Foreign invoice values. | Average per ton. |
|-----------------------|-------------|-------------------------|------------------|
| 1869 | 157,778,837 | \$2,868,612.53 | \$40.73 |
| 1870 | 139,656,256 | 2,731,951.08 | 43.10 |
| 1871 | 173,594,597 | 3,460,084.82 | 44.74 |
| 1872 | 190,645,764 | 4,012,188.63 | 47.14 |
| 1873 | 173,594,597 | 3,460,084.82 | 44.74 |
| 1874 | 65,358,053 | 1,663,481.07 | 25.45 |
| 1875 | 394,509 | 20,040.00 | 50.82 |
| 1876 | 9,074,043 | 260,866.31 | 28.96 |
| 1877 | 135,991 | 6,330.00 | 46.61 |
| 1878 | 4,981,546 | 136,771.99 | 27.26 |
| 1879 | 5,976,473 | 166,274.00 | 27.68 |
| 1880 | 30,223 | 825.00 | 27.29 |
| 1881 | 33,174,863 | 822,725.24 | 24.80 |
| 1882 | 44,908,913 | 882,699.20 | 19.67 |
| Total | 332,188,747 | \$7,316,301.87 | \$46.61 |

* Imported under duty of one cent per pound.

† Imported under the 10 per cent. reduction of duty, or nine-tenths of a cent per pound, provided for in the act of June 6, 1872, and going into effect August 1, 1872.

NOTE.—The 10 per cent. reduction of duty was repealed by act of March 3, 1875, taking effect from and after its passage.

Here it appears, taking in each case the average for ten years, that the iron rated as bars was worth \$20.32 per ton more in the foreign invoices than the bars dutied either 1.5 or 1.35 cents per pound; and \$31.74 per ton more than the bars dutied either one cent or nine-tenths of a cent per pound. This higher value necessarily involved a higher grade and quality than the other two classes of product. Such being the plain and easily ascertainable fact, the terms of the law required that the highest allowable duty should have been assessed. Failure to do so has been a neglect of official obligation, involved a considerable loss of revenue to the government, and inflicted damage upon the iron industries of the country.

The following exhibits show the ad valorem rates converted into equivalent specific duties, and the specific duties converted into equivalent ad valorem rates, as levied, in each case:

TABLE D.

Iron in Slabs, Blooms, Loops, or other Forms, Rated as Bars, and Dutied either 35 or 31.5 per cent. ad valorem.

| Year ending June 30. | Pounds. | Amounts of duty. | Equivalent specific duty per pound. |
|----------------------|-------------|------------------|-------------------------------------|
| 1869 | 32,721 | \$303.92 | \$0.015,400 |
| 1870 | 18,335 | 204.95 | 0.011380 |
| 1871 | 3,930,281 | 32,808 | 0.008371 |
| 1872 | 352,203 | 36,344.49 | 0.010371 |
| 1873 | 56,143,342 | 5,929.22 | 0.010355 |
| 1874 | 33,548,248 | 617,972.77 | 0.018007 |
| 1875 | 3,615,919 | 655,431.68 | 0.018179 |
| 1876 | 45,381,482 | 107,764.86 | 0.002372 |
| 1877 | 31,073,774 | 316,471.12 | 0.010139 |
| 1878 | 2,569,194 | 348,879.03 | 0.013508 |
| 1879 | 15,053,000 | 89,493.16 | 0.005938 |
| 1880 | 840,300 | 166,171.95 | 0.019799 |
| 1881 | 5,431,899 | 10,650.00 | 0.001952 |
| 1882 | 5,431,899 | 70,339.20 | 0.012898 |
| Total | 225,833,439 | \$2,561,346.66 | \$0.011342 |

Average ad valorem duty for the ten years, 1869-1878, \$2.47 per cent.

* See references and note under table A.

TABLE E.

Bar Iron Dutied 1.5 or 1.35 Cents per Pound.

| Years ending June 30. | Foreign invoice values. | Amounts of duty. | Equivalent specific duty per pound. |
|-----------------------|-------------------------|------------------|-------------------------------------|
| 1869 | \$145,724.86 | \$229,483.06 | 66.377 |
| 1870 | 295,428.29 | 103,194.61 | 28.192 |
| 1871 | 226,258.59 | 140,017.89 | 64.501 |
| 1872 | 271,138.54 | 150,005.93 | 55.324 |
| 1873 | 9,020.98 | 4,831.77 | 53.443 |
| 1874 | 224,623.71 | 90,934.10 | 40.483 |
| 1875 | 70,351.58 | 26,344.49 | 37.434 |
| 1876 | 1,150.00 | 497.26 | 43.235 |
| 1877 | 30,444.15 | 12,553.59 | 41.238 |
| 1878 | 31,523.34 | 14,809.94 | 46.938 |
| 1879 | 31,523.34 | 14,809.94 | 46.938 |
| 1880 | 2,118.00 | 858.55 | 40.528 |
| 1881 | 50,000.00 | 25,051.34 | 50.109 |
| Total | \$1,631,137.01 | \$99,772.48 | \$7.00 |

Average specific duty per pound for the ten years, 1869-1878, \$0.014766.

* See references and note under table B.

TABLE F.

Bar Iron Dutied One Cent or Nine-Tenths of a Cent per Pound.

| Years ending June 30. | Foreign invoice values. | Amounts of duty. | Equivalent ad val. duty, per cent. |
|-----------------------|-------------------------|------------------|------------------------------------|
| 1869 | \$2,868,612.53 | \$1,577,781.37 | 55.002 |
| 1870 | 2,731,951.08 | 1,396,562.56 | 51.120 |
| 1871 | 3,460,084.82 | 1,735,946.07 | 50.071 |
| 1872 | 4,012,188.63 | 1,666,457.54 | 41.537 |
| 1873 | 3,460,084.82 | 72,193.76 | 41.812 |
| 1874 | 1,663,481.07 | 588,222.64 | 35.361 |
| 1875 | 20,040.00 | 3,045.02 | 15.207 |
| 1876 | 260,866.31 | 81,666.46 | 31.113 |
| 1877 | 6,330.00 | 1,559.91 | 24.626 |
| 1878 | 136,771.99 | 38,533.96 | \$28.174 |
| 1879 | 166,274.00 | 59,764.73 | 35.944 |
| 1880 | 825.00 | 278.00 | 33.700 |
| 1881 | 822,725.24 | 331,148.63 | 40.250 |
| 1882 | 882,699.20 | 449,089.13 | 45.425 |
| Total | \$7,316,301.87 | \$8,243,143.88 | 47.603 |

Average specific duty per pound for ten years, 1869-1878, \$0.009954.

* See references and note under table C.

† Should have been 35 per cent. ad valorem, instead of the specific duty of 1 cent per pound.

‡ Should have been 31.5 per cent. ad valorem, instead of the specific duty of nine-tenths of a cent per pound.

Table D shows that the rate of 35 per cent. ad valorem was correctly assessed in only three years—that is to say, in 1869 and 1870, and in the case of a small part of the importations in 1873. On those occasions the highest specific duty allowable would have yielded less revenue than the ad valorem rate; hence, it was properly substituted for the specific duty, and the requirements of that time may have given rise to the usage which has been since followed. In all the other years, including the most of 1873, neither the ad valorem rate of 35 per cent. nor that of 31.5 per cent. yielded a specific duty equal to either 1.5 or 1.35 cents per pound, or one other of which was applicable and obligatory, except only in the instances wherein the descriptive list of shapes and sizes, as specified in the law, would not fit the case. On account of the unusually low average price per pound, the ad valorem rate of 35 per cent. amounted to less than a specific duty of even one cent per pound. All this misconception of the statutory provisions has been a serious loss to the revenue and an abatement of the protection intended to be given to American industry.

Table E indicates that the proper duty was assessed in every case, circumstances having permitted the false usage to work out a correct result.

Table F contains three instances of an unwarrantable assessment of duties. These errors came of neglect to substitute the ad valorem rate of 35 per cent., or of 31.5 per cent., under the 10 per cent. reduction, whenever the specific duty of one cent, or of nine-tenths of a cent, per pound, would not amount to the related ad valorem rate.

An examination of the first three tables will show that, while the quantities of bar iron represented in Tables B and C rapidly and largely declined for some years after the close of the fiscal year 1872, the quantities of iron rated as

tion. Within the past two years one by one these idle mills have resumed, until but two were cold, the old Wood's mill, at Saw Mill Run, last operated by Mullins & Mallory, and the old Vesuvius mill, of Lewis, Dalzell & Co. The latter, as previously announced in our Industrial Items, has been purchased by John Morehead, the well-known pig-metal broker of that city, and will be at once put in operation, and it is understood that what of the Wood's mill can be run will be put in operation to make muck bar. What is known as the New Etna Mill, of Spang, Chalfant & Co., was never finished, and is, of course, idle and not included. This means not simply that Pittsburgh will now make as much iron as ever before, but a large percentage more. During the panic the mill-owners of the Smoky City learned the secret of increasing output, and, though a number of the mills were idle, the make of rolled iron in 1878 exceeded that of 1874. In addition to this, some of the mills have increased the number of furnaces and trains of rolls. Altogether it looks as though Pittsburgh will show in 1880 a very great increase in tonnage of iron manufactured.

Railroad Accidents.

When a man of large intelligence, who has devoted years to the careful study of a subject, writes a book which is in some sense a monograph on that subject, it is pretty sure to be of interest and value. Such a book we have in Mr. Charles Francis Adams, Jr.'s "Notes on Railroad Accidents," which merits the careful attention of all who are interested in the management of our great lines of overland transportation. In publishing what he modestly calls "Notes," gathered during ten years of service as a railroad commissioner of Massachusetts, Mr. Adams has had a highly commendable object in view. He has undertaken to correct many wrong opinions as to the causes of railroad accidents and the best means of preventing them. In continuing what might be termed a popular agitation of the subject, he has very correctly begun by presenting the facts in an attractive and simple form. It is an astonishing, and by no means an encouraging, fact that the public in general are very indifferently informed in regard to the exigencies of modern railroad transportation and its risks. The glaring ignorance of both displayed by public men, as well as by the newspaper press, is attested by the crude suggestions freely offered whenever a great disaster strikes the world. Mr. Adams has no doubt keenly felt this want, as he refers repeatedly, in strong terms, to the result of this state of affairs as exhibited by unwise and impractical laws on the statute books of many of our States. Going to the root of the evil he attempts to enlighten the public, while at the same time he makes a vigorous effort to convince railroad managers and directors of the necessity of prompt and harmonious action in examining and adopting meritorious improvements, designed to lessen the dangers of travel and render the railroad carriage of an express train in motion what Mr. Bright claims it to be—the safest place to be in.

The long list of ghastly catastrophes which recklessness, neglect and accident has brought about in connection with railways, was singularly enough opened on the eventful 15th of September, 1879, the inauguration day of the first railway, the Manchester and Liverpool, when Mr. William Huskisson, a very prominent man in politics at that time, was killed while in conversation with the Duke of Wellington. Stephenson, in carrying him where medical attendance could be obtained, 17 miles, in 25 minutes, revealed to his frightened contemporaries a glimpse of what steam carriages were capable of accomplishing, and the long exemption from accidents, covering a period of 11 years, soon caused people to forget the terrible warning of Mr. Huskisson's tragic death. The precautions taken were, it is true, primitive and in some cases comical, involving as they did the running of independent pilot engines in advance of all night passenger trains. The first terrible accident which did much to retard progress of railroad construction in France was that of Versailles, when more than 50 persons perished.

Mr. Adams briefly recites the details of the "Angola horror," in 1867, and the Ship-ton disaster of 1874, in England, both of which were due to the utter impossibility to stop the motion of the train quickly enough. The former accident was aggravated by a feature which still constitutes a great danger to travelers on American roads, the risk of fire caused by the upsetting of the stoves used to heat the cars. The Wollaston disaster is cited by Mr. Adams as a conspicuous example, revealing a weak point in an approved appliance for stopping the momentum of a train, and the unsoundness of the idea that the strong American car construction is equal to every emergency as regards resistance to train momentum. As an instance of stolid British conservatism, Mr. Adams relates a number of shocking encounters between passengers and maniacs, criminals or drunkards traveling in the same compartment. Although in every case the possibility of such occurrences was directly traced to the absence of any means of communication between the occupants of the English compartment cars and the conductors or engineers, English railroad managers and directors persistently refused to adopt the simple device of the bell cord. The

author, however, warns Americans not to pride themselves on their own ingenuity, which he claims has failed to devise means to banish the stove from our railway cars.

Mr. Adams is very severe in his condemnation of the methods of car construction previous to the introduction of the Miller platform and buffer, which he considers one of the "four or five really noticeable advances which have of late years been made in railroad appliances." He cites the opposition to its introduction as an example of the "objecting capacity of the typical practical mechanic, whose conceit, as a rule, is measured by his ignorance, while his stupidity is unequalled save by his obstinacy." In support of his statement that, as the rule, defects in railway management or equipment must be emphasized by the loss of life, Mr. Adams relates the sad story of the Camphill disaster, where a regular train collided with an excursion train carrying hundreds of children. Although primarily due to the negligence of the conductors, the accident must really be attributed to the recklessness of men who operated a single-track road without the systematic use of the telegraph in connection with its train movements. On the other hand, the unskillful or negligent use of the wires has sometimes caused terrible calamities like that at Thorpe, in England, in 1874, and a similar one at Tyrone, Iowa, in 1875, where more serious results were averted by the strong construction of the cars. The Abergeldie disaster in 1868 proved the danger of lax discipline, and the recklessness of stopping cars near the head of an incline. The accident was terribly aggravated by the burning of oil cars, which also in the case of the New Hamburg catastrophe, swelled the long list of the killed and the wounded.

A class of accidents which is much more known in America than in England is that of bridge disasters, which have led to some of the most extraordinary legislative regulations, and pointedly show how much inferior—almost worthless indeed—is the American practice of examining accidents before an incapable jury, compared to the British method of scientific investigations by trained experts. The Norwalk, Conn., drawbridge disaster, in May, 1853, by which 46 people were killed, led to the notorious Connecticut law, which provides that every train must come to a dead standstill before entering upon any bridge in which there is a draw, a crude, but adequate remedy where traffic is light, but entirely impracticable where roads are crowded. While trains on American roads continue to run into open draws, no one single case has been known to occur on English roads since 1870, because the interlocking of all draws in railroad bridges with a proper system of signals, is made compulsory by law. But while accidents at draws have been comparatively rare, bridge accidents are certainly the worst to which railway travel is exposed. This is shown by the terrible Ashtabula and Tariffville disasters. The first bridge was old, faulty in its construction, and had given indications of weakness repeatedly, which, though they had been distinct, had not been regarded. The Tariffville bridge was of wood, and though it broke down in a way quite similar to the Ashtabula bridge, the disaster was not, so far as the evidence went, due to weakness or overloading, but arose, most probably, from the derailment of a locomotive. It was caused by the absence of simple precautions which, as a recent accident of a similar nature has shown, are still very widely disregarded. Mr. Adams urges that all that is necessary is to make the ties and flooring of all bridges between the tracks and on either side of them sufficiently strong to sustain the whole weight of a train off the track and in motion, while a third rail or strong truss of wood, securely fastened, should be laid between the rails throughout the entire length of the bridge and its approaches. He strongly advocates legislative enactments looking to an enforced adoption of this plan.

As regards the best method of car couplings, the conclusion arrived at by the greater number of railroad mechanics in favor of the strongest and the closest is probably sound, although the Des Jardines disaster, in Canada, proved that there are two sides to this question also. Mr. Adams devotes a whole chapter to a full account of the Revere disaster in 1871, which was caused by the utter inability of the Eastern Railroad of Massachusetts to cope with an extraordinary rush of business with the aid of its antiquated appliances and systems. Terrible as the lesson was, it has had a very salutary effect upon the management of New England roads, although popular indignation at the time carried many far beyond the bounds of reason in their denunciations and their suggestions of remedies. It led to a universal use of the telegraph for the dispatching and the regulation of the movements of trains. The Revere accident was a rear-end collision, a class which is by far more frequent in America than in England. This fact Mr. Adams attributes to the universal use in the latter country of the block system. While admitting the exceptional qualities of the average American locomotive engineer, whose facility in adapting himself to circumstances and in taking care of himself and the property and lives in his charge, is wonderful, the author points out that the exigencies of growing traffic will compel a universal adoption of the block system, which has been employed with great success in England. He notes the enormous traffic of the Cannon Street Station, London, into which 550 trains

enter, and which as many leave in 18 hours. The drawbacks of the block system are very great, it is true; it is clumsy and complicated, and necessitates the employment of a large number of skilled men, and therefore it is probable that the American block system of the future will be essentially different from the present English system. Efforts in America have been directed toward the solution of the question of devising an automatic system which should provide against rear collisions, highway grade crossings and tracks broken at drawbridges or at switches. A marked degree of perfection has been attained in this direction by the Hall Electric and the Union Safety Signal Company, of which the former is the older and the most thoroughly elaborated. Mr. Adams is very emphatic in his condemnation of the plan, often advanced in opposition to these and similar appliances, that they are too expensive or too complicated. He urges the necessity of interlocking signals and switches as an indispensable adjunct to any really heavy junction or terminal train movement, and for drawbridges and level railroad crossings. Its general introduction into the American railroad system is a question of the value of land and the concentration of traffic, which is as yet only imperfectly understood.

Mr. Adams discusses at considerable length the merits and the scope of the Westinghouse brake, detailing the successive steps by which it was brought to its present excellence, and citing a number of cases in which its efficiency was abundantly demonstrated. This is followed by a clear and very interesting account of what is aptly called the "battle of the brakes," now being so fiercely waged abroad, and notably in England. The main contestants are the Westinghouse and the Smith, both American vacuum brakes. The former carries with it the weight of scientific and official authority, while the latter finds its greatest number of adherents among railroad men, who admire it on account of its simplicity and cheapness.

The remaining chapters of Mr. Adams' work are filled with statistical data in regard to railway accidents, revealing, as they do, the great lack of reliable and authentic figures in this country. Taken as a whole, the book is admirably adapted to its purpose, that of creating and directing public opinion. It is popular throughout, and is very impressive in its descriptions as well as in its arguments, and though perhaps Mr. Adams is sometimes carried away by his righteous indignation or by an exaggerated opinion of certain devices or appliances, his book is likely to do much good and deserves a wide circulation.

Domestic and Foreign Commerce.

The report of Mr. Jos. Nimmo, Jr., chief of the Bureau of Statistics, on the internal commerce of the United States, contains one paragraph that we commend to the attention of those who claim that the most important subject now before the American people is revenue reform, meaning thereby a reduction of the tariff, in order that articles of foreign production may be imported in larger quantities. The passage referred to is as follows: "It is impossible to state accurately the total value of the internal commerce of the country. Measured by the value of the commodities transported, it is many times greater than our foreign commerce. The value of commodities transported on the Pennsylvania Railroad alone, between Philadelphia and Pittsburgh, during a single year, has exceeded the value of the imports into the United States from foreign countries."

If this is true, and there can be no question about it, of the two the most important and interesting question before our people to-day is the internal, and not the foreign commerce of the country. The importance of this question of internal transportation is but poorly realized. It is the only dead weight on the extension of our production of all kinds, and in the near future its regulation and the cheapening of its cost will be prominent topics of discussion and thought among our statesmen and engineers.

There is another thought that forces itself upon the attention of the reader of this paragraph from Mr. Nimmo's report. With the exception of a very small fraction, this internal commerce is of goods manufactured or produced in the United States by our own people. The imports into the United States are the products of the labor of other countries. Which to us is the more important subject—the cheapening of internal transportation, or the reduction of duties that goods produced abroad may be imported in greater quantities?

American Goods Abroad.

The New York Tribune, of December 13th, prints the following:

John G. Rollins, head of the American house of John G. Rollins & Co., American merchants in London, England, who has been in this country for the last six weeks, sailed on his return on Thursday. During his stay in this country Mr. Rollins' time has been spent among manufacturers, his trips extending from Maine to the Mississippi. In a conversation with a reporter of the Tribune he said: "I found wherever I went that our manufacturers are all feeling well. They are very much pressed by orders, and at better prices than for five years past. I am afraid, however, that the advance in prices of some lines of goods will seriously interfere with our export trade, and will greatly tend to increase imports."

"What is the immediate danger?"

"That the increase in the price of American manufactured goods will give the German, English and French manufacturers an advantage over American manufacturers in the foreign markets, and will tend to break down the foothold which they have obtained. The competition has been very great, and it has been only by the utmost perseverance on the part of our merchants and agents abroad, joined to the superior quality of the articles offered for sale, that they have been able to compete successfully with foreign manufacturers in their own markets."

Mr. Rollins settled in London in 1862. In the most energetic manner he has worked early and late to push the sale of American manufactures in European markets, and, as he well says, "has done more missionary work in this direction than any other American abroad." He declared that while there was a great future here at home and while Europe must have our cotton, petroleum and provisions, there was not much chance of successfully contesting with foreign manufacturers unless we can compete with them in price. Mr. Rollins is now building a large and handsome warehouse close to the river Thames, to be occupied as sample rooms for American manufactures. Three floors of this are to be used by Fairbanks & Co. for the exhibition and sale of their scales. The warehouse is within five minutes' walk of the Bank of England and the Royal Exchange. It fronts on Upper Thames street, while the rear abuts on the river, so that goods can be landed directly from the ship or exported directly from the warehouse.

Mr. Rollins was decidedly of the opinion that the revival of business in this country would be greatly expanded by emigration from the overstocked labor markets of Europe.

Credit which is Considered Discredit-able.

Sheffield has two newspapers which look very much alike, and we seem to have made the mistake of crediting to the *Independent* an editorial which probably appeared in the *Telegraph*. We judge so, at least, from the following letter received since our last issue:

SHEFFIELD, Nov. 27, 1879.
To the Editor of the Iron Age, New York:—Sir: I observe that in your issue of the 13th November you quote a "remarkable editorial" on "What Free Trade is Doing for England," and you attribute it to the *Sheffield Independent*, of October 11. Your description of the article as "remarkable" is very apt, but it would be still more "remarkable" if a misrepresentation of facts so erroneously extravagant, had ever appeared in a journal which, like the *Independent*, has ever been and still is a firm and unswerving champion of free trade. I shall be much obliged if you will, by publishing this letter in your next issue, give me the opportunity of saying that no such article has ever figured the columns of the *Sheffield Independent*. I am not, I think, unreasonable in asking this, since such of your readers as know anything of the *Independent* must have been forced to the conclusion that hopeless insanity could alone account for the publication in it of the article you print. I am, sir, your obedient servant,
EDITOR SHEFFIELD INDEPENDENT.

We do not think the *Independent* would have had anything to be ashamed of if it had printed the article in question, which was remarkable only for the frankness of its confession. However, we regret the accident of crediting the wrong paper, and the unintentional injustice which the mistake did to both papers.

Pushing Work on the Inter-Oceanic Railway.

Mr. Learned and associates, who hold an important concession from the Mexican Government for the construction of a railway across the Isthmus of Tehuantepec, from the Atlantic to the Pacific Ocean, are enthusiastic in pushing their work. Competent engineers are being appointed for all responsible positions, and supplies of materials, implements, &c., are being forwarded with dispatch. The latest movement is the appointment of Mr. Van Brocklin, late chief engineer of the Metropolitan Elevated Railway, to accept a similar position in the Tehuantepec Inter-oceanic Railway Company, and this gentleman will leave New York December 27th, to commence his work. On his arrival two or three strong working parties will be organized, taking up different points along the line of the road. He will be in communication with a local engineer, appointed by the Mexican Government, who have signified a readiness to co-operate in any way that will further the grand object of connecting the two oceans. Mr. George Tyng, of New York, is the general agent of the company, stationed at the mouth of the Goatzacoalcos river, which forms the Gulf terminus of the route.

Last Saturday, 13th inst., a party of engineers, headed by Mr. Van Brocklin, a brother of the chief engineer, left this city in the steamer City of New York, to commence operations at the mouth of the Goatzacoalcos River, leveling and grading preparatory to laying the rails. Among their appliances are a couple of Lasher's grinders, purchased in Cincinnati. They are worked by horse power, and on an ordinary road will advance at the rate of two miles a day.

Among other departures the bark Ephraim Williams sailed a few days ago, taking out supplies for several hundred men, including two dozen shovels, 25 dozen picks, &c., besides carts, lumber wagons, platform cars in sections, locomotives, blacksmiths' and carpenters' tools, a large quantity of rails, ties, mule tackling, contractors' supplies of all sorts; also a surveyors' outfit of tents, instruments and provisions; in all over 500 tons. After discharging, the bark will be employed in carrying railway ties from Cedar Keys, in Florida. In a few days another vessel will be dispatched for this port with railway cars and miscellaneous supplies.

From the Mexican capital the most favorable accounts are received. Mr. F. D.

Garay, of the Department of Public Works, under date Dec. 2, states that the government is fully persuaded that the Isthmus of Tehuantepec Railway will effectually forestall all rival schemes. On the day this letter was written, in accordance with the terms of the concession, \$100,000 was deposited by the company in the Monte Pedal, as a pledge or security that the agreement would be carried out in good faith by the grantees of the concession. The company contend that no ship canal can ever be built to compete successfully, on account of the enormous cost in comparison, the American Isthmus being pronounced feasible by competent engineers. It is provided at both termini with good harbors, and all the improved appliances will be at command for the speedy and economical trans-shipment of freight.

Iron Workers in the Recent Procession at Philadelphia.

In the reports of the great procession in Philadelphia, on Tuesday, in honor of Gen. Grant, we find the following mention of establishments known to our readers:

Marshall, Hamilton Disston; Aids, Isaac A. Sheppard, Geo. Barnett, Thomas Devlin, F. O. Hanson, George W. Myers, George Pilkington, Thomas W. South and Robert Johnson. Keystone Saw Works (Henry Disston & Sons), employees led the division, under the marshaling of Horace C. Disston.

They numbered 900. At the head of the column was a large truck, drawn by five powerful iron-gray horses, in tandem, dressed with red, white and blue cockades. On the truck was an enormous circular saw, which revolved as the vehicle proceeded, and to the rear and a little less in height were two other like, but smaller saws; on the sides of the truck were long saws, bearing in large letters the word "Welcome."

Then came the Pioneer Corps, Jonathan Marsden, captain, and Thomas Fleming, aid, with the Stephen Girard band. Following these were men bearing guidons and flags and wearing purple silk badges; boys drawing an old-fashioned fire hose carriage, the cylinder of which was formed of large circular saws; the Elm Tree and Elm Tree, Jr., Pioneer Corps. Throughout the line were interspersed handsome silk banners, flags and various devices. On large structures, some in pyramidal form, others in terraces placed upon wagons and trucks drawn by from four to six horses each, were displayed the tools and manufactures of each department of the works. These vehicles were handsomely draped in bunting and dressed with flags, and the horses were gaily caparisoned. One large wagon contained a steam engine with steam up. The file and wood-work departments were accompanied by the Washington Cornet Band, of Holmesburg. In this line were also a large number of barouches, the occupants wearing badges.

Second in the line of this division were the employees of the Philadelphia Hardware and Malleable Iron Works (Carr, Crawley & Devlin), 200 in number, with the Great Western band, George Dougherty, marshal. They had a large two-horse wagon, in which were displayed specimens of the firm's manufactures. The wagon was trimmed and decorated with bunting and flags, and bore displayed "Welcome to the City of Brotherly Love," surrounding a portrait of Gen. Grant.

Then followed employees of the Excelsior Stove Works (Isaac A. Sheppard & Co.) with the Resolute Fire and Drum Corps. They numbered 150. In their line was a Pioneer Corps, George Barford, captain, and a large wagon dressed with bunting and containing a nickel-plated stove and range, and a lad representing Young America. The men wore badges, &c.

The employees of the Black Diamond File Works (G. & H. Barnett) followed with 130 men, Samuel Carver, marshal. With them was a pioneer corps under command of Frank Stelmor, and two large and handsomely decorated wagons. In one of them was an immense file, weighing 250 pounds. This wagon was filled with small boys appropriately dressed. In the other wagon an employee was exhibiting the method of working in the manufacture of files.

The tin roofers and galvanized-iron workers of Austin, Oblyke & Co., 75 in number, followed with a file-and-drum corps of employees. The men wore badges and carried specimens of their work, and in one large wagon were specimens of an expanding conductor, and on another wagon was a large representation of the cornice and roof of a house, in metal, as a specimen of the firm's work. In this line were a number of flags and a pioneer corps, of which Martin Walsh was captain.

The employees of Farrel & Co., safe makers, 80 in number, were under the marshaling of George Pfeiffer. They wore handsome badges and had with them two large decorated wagons in one of which, drawn by six horses, was a finished safe, and in the other a man was at work finishing a safe.

F. O. Hanson & Co., iron railing makers, turned out 30 men under command of Wm. Hanson. They had with them a wagon decorated with evergreens and bunting, &c.

Rieble Bros. had in line a large wagon drawn by four unusually fine horses. In the wagon was exhibited a scale beam 15 feet in length. It is called the General Grant, was made for the Russian government and is capable of weighing 120,000 pounds.

Lovegrove & Co. had a steam engine in a decorated wagon.

Wm. Kaufman, tin and gravel roofer, had a wagon profusely decorated with bunting.

R. S. Menamin (machine works) had a wagon decorated with flags and bunting, &c.

Day Bros., iron and steel workers, exhibited a forge in operation, &c., in a wagon dressed in flags, &c.

Adams & Shay, wire-work jobbers, had a wagon dressed in evergreens and bunting, and exhibited a Christmas garden, with metal railings, &c.

Henry Crawshaw, the last surviving son of Wm. Crawshaw, the iron king of Wales, died recently at the age of 75 years.

Special Notices.

Valuable Mineral Property For Sale.

Situated upon the New Jersey Midland Railroad, near the village of Hamburg, Sussex County, N. J., adjoining the land of Moses Taylor, Esq., and about half a mile from the mineral property of the New Jersey Zinc Company, and in a line of the mineral of Moses Taylor, Esq., and the Franklin Iron Company. A prolongation of the veins of zinc and Frankfordite in these companies would run about half a mile through the property. The farm is one of the most valuable in Sussex County, containing 215 acres, and has a grist mill and other buildings upon it, the present rental of which is equivalent to 3 per cent. upon the price asked, viz. \$40,000.

There is upon the property an extensive deposit of white limestone.

Apply to JOHN H. BROWN, Agent,
Waywanda, Sussex County, N. J.,
Or to HOMER MORGAN,
2 Pine Street, New York

ELIZABETHPORT ROLLING MILL,
Elizabethport, N. J.,

Common and Refined
BAR IRON,
Fish Plates, Spikes, &c.

DANIEL W. RICHARDS & CO.,
Importers of and Dealers in Scrap Iron and Metals,
88 to 96 Mangin St., New York.

Foundry and Machine Works
For Sale,
TO CLOSE COPARTNERSHIP.

Located in Columbia, Lancaster County,
Pa., on a Main Street.

Ground 220 ft. front, 195 ft. deep. Machine Shop, 60x40, with Pattern Shop in second story; Smith Shop, 34x28, with Boiler House adjoining; Foundry, 72x53, with 2 cranes and 2 hot Brass Furnaces. All brick buildings with slate roofs, and rebuilt 1879. Also, frame Pattern Warehouse, slate roof. Patterns, Tools and Fixtures for Blast Furnace, Rolling Mill and general heavy work. Works are near several railroad depots, with siding alongside, and are doing a good business. Will sell out entire works, or sell ground and buildings with the steam power for other purposes.

PERROTET & HOYT, Proprietors.

FOR SALE.

A 1000 Pound Steam Hammer.

ALSO

A BOILER PLATE SHEAR.

Both Tools by Ferris & Miles, of Philadelphia.

Neither one has ever been in use.

Address,
THE JOHN A. ROEBLING'S SONS CO.,
Trenton, N. J.

FOR SALE.

The entire Canadian right of Kenyon's Adjustable Chain Pump Bucket, a superior and substantial article. Can be accurately adjusted to fit the tube, and enlarged to take up the wear, so that the pumps can be kept in good working order. United States County and State rights for sale. Address,

THOMAS KENYON, Patentee,
Box 103, Hamilton, Ohio, U. S. A.

FOR SALE OR RENT.

The Rolling Mill Property at Topeka, Kansas, known as the Topeka Rolling Mill, for rolling old rails. Capacity about fifty tons per day. Machinery of most approved kind and in good order, having been run but about six months. Parties desiring to lease or buy the property can do either on favorable terms. For particulars address,

T. B. SWEET,
Topeka, Kansas, or
ROYAL M. BASSETT,
Birmingham, Conn.

WANTED.

To purchase a half interest in some well established and paying Hardware and Housefurnishing business in some growing town west of Chicago, and with an elderly gentleman preferred. Or will accept a good situation as receiving, shipping or to take charge of an order department in a wholesale house. Have had several years' experience, and can furnish A1 references.

Please address, HARDWARE,
Care Letter Carrier No. 26, Buffalo, N. Y.

ANTHRACITE BLAST FURNACE

For Sale or Lease.

Situate on the Susquehanna & Schuylkill R. R., near Pine Grove, Schuylkill Co. Capacity, 120 tons per week. With 140 acres of good land, 20 Houses, Barns, Stables, &c. A branch of the Susquehanna Creek runs close to the Furnace, 29 miles from Cornwall Ore Bank, 18 miles from limestone, and 10 from coal.

THOMAS COOCH,
Pottsville, Pa., October 9, 1879.

FOR SALE, VERY LOW.

Two Cranes, 24 feet high, 30 feet sweep; two do., 18 feet high, 30 feet sweep; four small do.; 30-horse power Engine; Cupola, 45 inches in diameter; Charcoal Crusher; large Blower; heavy Truck, medium Screw Press; small Boiler, &c.

R. FRAZIER, Agt.,
Bordentown, N. J.

FOR SALE.

Thorne & DeHaven Postable Drill.
Bement Car Wheel Borer, 48-inch.
35-inch Radial Drill, A. Box & Co.
26 in. x 36 in. x 10 ft. 6 in. Bement Planer.
26 in. x 10 ft. Chuck Lathe, N.Y. Steam Engine Co.
Fair Planer Centery. Centering Machine.
Mine and Quarry Pumps. Mine Hoist.
Wood Working Machinery, all kinds.

A. G. BROOKS & WINEBRENER,
261 N. Third Street, Philadelphia.

TO MANUFACTURERS AND CAPITALISTS.

FLOWER PINS.

PATENT FOR SALE.

Address
J. H. FLUMMER,
1276 Pacific Street, Brooklyn, N. Y.

For Sale Immediately,

A Valuable Patent Improved Horse Shoe Machine.

This machine and patent will be sold at a reasonable figure; the Patentee and proprietor not having sufficient means to carry on the business of manufacturing. For particulars address

HARLAN PAGE,
126 Maplewood Ave., Germantown, Phila., Pa.

SHAP IRON and Old Rails supplied for cash, in quantities and of qualities to suit the American market, by A. NORRINGTON & CO., 37 Great St. Helens, London, England. First-class references given.

Special Notices.

FOR SALE,

To Close Partnership.

We will sell the following property at private sale to close the partnership of D. Hillman & Sons: THE TENNESSEE ROLLING MILL, situated on Cumberland River, Lyon County, Kentucky, ten miles from Paducah and Elizabethtown Railroad.

This mill consists of the following machinery: 1 Plate Mill, 65x36; 2 High Rolls, driven by 60x30 engine; 1 Steam Hammer—Condée's—5 ton and 1 foot stroke
1 Plate and Sheet Mill, 75x22.
1 16-in. Bar Mill, train complete.
1 9-in. Bar and Rod Mill; 1 8-in. Bar and Hoop Mill.
9 Puddling Furnaces; 13 Knobbing Fires.
12 Boilers, engines, large and small; Muck Train, Borden Squeezer, &c.
1 Run-out Fire, 7 Heating Furnaces, 2 Annealing Furnaces.
7 Pair Shears, 1 Steam Saw, 1 Testing Machine, Railroad Tracks and Scales, full sets of all Tools needed, Store House, Office, Warehouse and many workmen Houses, with 6500 acres land.

The TRIGG FURNACE, In Trigg County, Kentucky.

A first-class Furnace, new, built in 1872. Charcoal furnace—48 feet high, 12 foot bosh; 60 pipe; Davis Hot Blast; Four Boilers; Horizontal Engine, 6-foot stroke, 20 in. diameter; 3 Blowing Cylinders, 6 feet by 26 inches diam. Furnace arranged for Hot or Cold Blast. Pig has great reputation. With 5500 acres of land.

TERMS OF SALE.—1-4 cash. Balance on 1, 2 and 3 years. Lien retained to secure purchase money.

This property is reached by Paducah & Elizabethtown R. R., Eddyville, Ky., Station, or via Cumberland River. Correspondence solicited. Parties will be shown the property at any time.

Furnace or Mill, either, will be sold separately, if desired.

The Boiler Plate and other Irons made at these works have national reputation, being known as "Tennessee Iron." Address

D. HILLMAN & SONS,
Tennessee Rolling Works,
Lyon Co., Kentucky.

For Sale,

THE ROUGH AND READY HOT BLAST

CHARCOAL FURNACE

situated in one of the healthiest regions of Tennessee, with all its modern improvements, including a 30-horse-power engine, and two 20-foot boilers. The furnace is in close proximity to inexhaustible supplies of rich brown hematite ore and limestone, and the rail and river shipping facilities are excellent. Iron can be manufactured for not exceeding \$18.00 per ton, and put into market within 24 hours. Furnace can be put into blast without much expense for repairs. Included in the property are 9000 acres of fine timber land, (including 1500 acres which are improved and under cultivation) a Saw and Grist mill with 12 horse-power engine fine boiler, Carpenter and Blacksmith shops, Stables and Cribbs, Coal, Engine, Cinder, Casting, Tool, Store and Ware, and about 60 Dwelling Houses. It is the wish of the undersigned to sell only the whole of this property, which can be bought on reasonable and liberal terms. For further particulars

Address

D. THEOBALD, Youngstown, Ohio.

A. GUCKENHEIMER & BRO.,
93 First Avenue, Pittsburg, Pa.

PRIVATE SALE

OF A VALUABLE

Rolling Mill Property.

The undersigned offer at private sale that certain property known as the "Cedar Works," formerly the property of the York County Iron Company, situated on the Northern Central Railway and the Frederick Division of the Pennsylvania Railroad, at York, Pa. The tract contains about seven acres of ground, with a stream of water passing the same, and on which is erected a frame iron roll Rolling Mill Building, about 100 x 200 feet.

The Machinery consists in part of the following, to wit:

1 Steam Engine, 15 H. P., with two pairs of Shears.

1 Steam Engine, about 40 H. P., with two Blowing Cylinders.

1 Steam Engine, about 150 H. P., with Duplicate Cylinder.

11 Puddling and Heating Furnaces.

15 Boilers, Steam Hammer.

1 Train Rolls for Merchant Iron.

1 Train Muck Roller.

1 Train Round Iron. Several Trains for T-Rails.

1 Crusher, Punch, Saws, Tools, &c.

The above property will be sold at a bargain. For further information apply to the

FARMERS' FIRE INSURANCE CO.,

York, Pennsylvania.

For Sale or Lease.

FOUNDRY,

NEW YORK CITY.

The plot of ground measures 275 ft. frontage by 100 feet deep. It has a splendid Foundry, 60x165 feet, with cupola, cranes, &c. If leased, additional buildings to any extent will be erected to accommodate any kind of manufacturing business.

Apply to
WM. J. FRYER, Jr.,
Atina Iron Works, 104 Goerck Street.

Bissell & Welles,

Wholesale Hardware Auctioneers,

83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and importers.

Wanted to Purchase,

AN

Iron Ore Mill, with Revolving Table.

Send description and price to

S. B. LOWE,
Chattanooga, Tenn.

Wanted Immediately.

Ten new or second-hand SCREWS, from 3/4 to 4 inches in diameter, about 12 feet long. State price.

J. R. MITCHELL & CO.,
Cedar Keys, Fla.

WANTED.

A traveling salesman to represent in the West a Chicago Heavy Hardware house. He must be a representative man, possessing character and ability that will fit him for canvassing the best trade. None but a man of large experience and good standing can fill the place. To the person wanted a permanent position and good salary will be given. Address, with references,

Office of The Iron Age, 83 Reade St., New York.

WANTED.—A Roll Turner wishes a situation; would take the management of a merchant mill in connection with the roll turning.

Address
MANAGER,
Office of The Iron Age, 83 Reade St., New York.

Special Notices.

SECOND-HAND

and NEW TOOLS

FOR SALE LOW.

December List No. 2.

Miscellaneous Second-Hand Tools.

All in Good Order, and will be sold very low.

Two Engine Lathes, 20 in. swing x 7 1/2 ft. bed.
Two Engine Lathes, 20 in. swing x 8 ft. bed.
One Engine Lathe, 24 in. swing x 12 ft. bed.
One Engine Lathe, 18 in. swing x 12 ft. bed.
One Engine Lathe, 18 in. swing x 10 ft. bed.
One Engine Lathe, 18 in. swing x 14 ft. bed.
One Engine Lathe, 18 in. swing x 8 ft. bed.
One Engine Lathe, 18 in. swing x 6 ft. bed.
One Engine Lathe, 12 in. swing x 5 1/2 ft. bed.
Seven Engine Lathes, 18 in. swing x 7 1/2 ft. bed. (Chain-feed Lathes.)

One Horizontal Boring Lathe.
Six Turning Lathes, 14 in. swing x 4 1/2 ft. bed.

Two Wood-Turning Lathes.
One Bement Double-Pulley Lathe.

One Planer, 24 in. x 5 ft.
One Planer, 30 in. x 7 ft. chuck, &c.

One Planer, 37 in. x 37 in. x 10 ft.
One Planer, 72 in. x 56 in. x 20 ft.
Two Planers, 18 in. x 5 ft.

One Planer, 24 in. x 6 ft.
One Traverse Drill.

One Four-Spindle Drill.
One Shaping Machine, 19 in. stroke.

Three Bolt Cutters, various sizes.
One No. 2 Bolt Cutter.

One Gear Cutter.
One new "Hardaway" Bolt Heading Machine, to head up to 3/4-in. bolts.

One new "Hardaway" Bolt Heading Machine, to head up to 1 1/4-in. bolts.

A lot of Saw Tables and Wood Working Machinery.

NEW TOOLS, Very Low.

One Shaping Machine, 14 in. stroke, Wood & Light.

Five No. 2 Bolt Cutters, Wood & Light.

One No. 1 Bolt Cutter, with center, Wood & Light.

Three No. 2 Bolt Cutters, with center, Wood & Light.

One Planer, 32 in. x 8 ft., New Haven.

One Upright Drill, 36 in. New Haven.

Please specify which of the above tools you want and we will forward all particulars.

A Woodruff & Beach

Beam Engine,

Low pressure, 42-inch cylinder, 84 inch stroke, with fly-wheel pulley 20 feet diameter, 36 inch face, and

Four Tubular Boilers,

60 inches in diameter, 30 feet long, and all connections practically as good as new.

For sale by

The Geo. Place Machinery Agency,

121 Chambers and 103 Reade St.,

NEW YORK.

A. J. STEINMAN, Chairman. W. B. MIDDLETON, Supt.
W. G. MENDENHALL, Sec'y & Treas.

OFFICE OF

PENN IRON COMPANY, Limited,

MANUFACTURERS OF

Merchant Bar Iron, Hammered and

Rolled Axes, Car Forgings, Bridge

Work, Fish Joints, Bolts, R. R.

Spikes, Bolt Ends, &c., &c.,

LANCASTER, PA.

WANTED.

A good second-hand Engine, 16 or 17 inch diameter cylinder, short stroke, to run about 200 revolutions per minute; suitable to drive a train of small rolls.

FOR SALE.

One large Planer, 25 ft. long, 5 ft. square, built very heavy, in first class condition. Also, one Boring Mill, one large Slotter, one Shaper, three Drill Presses, one small Lathe, lot of Vises, one Steam Hammer for making blooms, lot of Wood-Working Machinery for making patterns, Shafting and Pulleys; also, large lot of Flasks and Foundry Fittings, for doing light and heavy work, and one large Cupola and one large Foundry Crane, all in good condition and for sale cheap. Address

PENN IRON CO., LIMITED,
Lancaster, Penn.

For Sale.

23 in. x 48 in. CORLISS ENGINE.

Can be seen running. Will be delivered latter part of this month. Also 18 in. x 42 in. Hewes & Phillips. Can be delivered at once.

E. P. BULLARD,
14 Day St., New York.

BUSINESS OPPORTUNITY

A responsible Hardware house, well established in a healthy and prosperous Western city (not Chicago or St. Louis) want additional cash capital to extend a rapidly increasing trade. Long experience enables present partners to personally manage the business. An excellent opportunity to enter an established concern. Business has always been profitable. First-class references given and required. Only parties having ample ready means address

O. C. APPLETON,
Care P. O. Box 672, New York, N. Y.

SWEDISH ENGINEER OF MANY YEARS' experience in the manufacture of Iron and Steel, for several years manager of the furnace at the largest Martin-Siemens works in Sweden, and skilled in all pertaining to the construction and management of rolling mills, gas producers for sawdust and gas-welding furnaces, desires a position from next Spring. Speaks also English and German.

Address
K. 33,
Filipstad, Sweden, poste restante.

Jute Machinery for Sale,

Consisting of 4 break cards, 4 finish cards, 1 Robbing frame, 6 spinning frames, 9 looms, drawing frames, cap winder, calendar, &c. Harrison Corlies engine, 12x36, shafting, belting, Harrison boiler, &c., all in perfect order. With a daily capacity of 3000 yards. Bagging from butts or tow. For particulars inquire of

H. L. FEARING & CO.,
91 Commercial St., Boston.

Nov. 10, 1879.

For Sale.

Stock of hardware, stoves and implements, and store furniture, in one of the best towns in Kansas.

Address
HARDWARE,
Box 366, Salina, Kansas.

WANTED.—A situation as resident or traveling salesman or bookkeeper with a reliable house East or West, by a gentleman of ten years' experience in the Hardware and Stove business; understands bookkeeping by double entry. Good references. Address

F. O. BOX 1197,
New Haven, Conn.

Special Notices.

DON'T BUY

MACHINERY

Of any kind

UNTIL YOU WRITE TO US

for our List No. 20, containing full description, with prices, of over 2000 New and Second-Hand Machines, such as

MACHINE TOOLS,

BLACKSMITH TOOLS,

WOODWORKING MACHINERY,

STATIONARY AND HORIZONTAL

ENGINES AND BOILERS,

PORTABLE ENGINES,

HOISTING ENGINES,

CAR MACHINERY,

WATER WHEELS,

COTTON AND

WOOLEN MACHINERY,

SAWS,

STEAM PUMPS, &c., &c.

We offer the largest collection ever in the hands of ONE FIRM before, and at

PRICES FAR BELOW THEIR TRUE VALUE.

Enclose stamp and state fully just what Machine or Machines you are in want of. Address

S. C. FORSAITH & CO.,

MACHINISTS,

AND GENERAL MACHINE DEALERS,

MANCHESTER, N. H.

FOR SALE.

THE VALUABLE

ROLLING MILL PROPERTY

KNOWN AS THE

FORT ALLEN IRON WORKS,

At Weissport, Carbon Co., Pa.,

On the line of the Lehigh & Susquehanna Railroad, and Lehigh Canal, four miles east from Mauch Chunk, in the Coal and Iron district, and having good access to the New York and Philadelphia markets. This property consists of one puddle mill and three puddling furnaces; one large merchant mill with heating furnace to feed it; one small merchant mill with heating furnace; new engine and belt, and all the necessary machinery, in good repair, to run both mills. All the necessary tools for running the mills will be sold with the property. It can therefore be started with very small expense. For sale on favorable terms. Apply to

MARSHALL BROS. & CO.,

Front St. and Girard Ave., Phila.

</

December 15, 1879.
New List.

| RUSSELL & ERWIN MANUFACTURING CO.'S | | | | | |
|---------------------------------------|-------------------|---------|-------------------|---------|-------------------|
| REVISED PRICES. | | | | | |
| Locks and Latches in Numerical Order. | | | | | |
| No. | Price per doz. | No. | Price per doz. | No. | Price per doz. |
| 000 | 4.65 | 253 | \$88.50 | 812 | \$170.75 |
| 00 | 1.75 | 255 | 7.05 | 813 | 23.75 |
| 0000 | 5.00 | 256 | 7.50 | 820 | 6.00 |
| 0000 | 10.00 | 260 1/2 | 8.00 | 821 | 8.00 |
| 0000 | 8.10 | 261 | 8.75 | 822 | 11.25 |
| 0000 | 12.00 | 261 1/2 | 10.50 | 825 | 12.75 |
| 0000 | 5.55 | 262 | 9.00 | 826 | 14.55 |
| 0000 | 7.25 | 263 | 10.25 | 827 | 17.15 |
| 0000 | 9.00 | 264 | 11.00 | 828 | 18.00 |
| 0000 | 9.00 | 265 | 12.00 | 831 | 13.00 |
| 0000 | 12.00 | 270 | 11.25 | 832 | 22.50 |
| 0000 | 9.95 | 271 | 12.50 | 833 | 28.50 |
| 0000 | 15.00 | 272 | 14.25 | 840 1/2 | 5.00 |

| | | | | | |
|-----------------|-------|------|-------|-------------------|------|
| 1 $\frac{1}{4}$ | 10.85 | 273 | 13.50 | 80 $\frac{1}{2}$ | 3.75 |
| 2 $\frac{1}{4}$ | 28.5 | 285 | 13.25 | 81 $\frac{1}{2}$ | 5.00 |
| 3 $\frac{1}{4}$ | 11.75 | 286 | 10.50 | 860 | 4.65 |
| 4 $\frac{1}{4}$ | 16.25 | 300 | 4.65 | 860 $\frac{1}{2}$ | 5.00 |
| 5 $\frac{1}{4}$ | 16.00 | 0300 | 7.50 | 861 | 5.00 |
| 6 $\frac{1}{4}$ | 17.50 | 301 | 6.50 | 861 $\frac{1}{2}$ | 6.25 |
| 7 $\frac{1}{4}$ | 60.50 | 0301 | 10.00 | 862 | 7.00 |
| 8 $\frac{1}{4}$ | 56.45 | 302 | 8.10 | 862 $\frac{1}{2}$ | 8.25 |
| 9 $\frac{1}{4}$ | 29.50 | 0302 | 10.00 | 863 | 6.25 |

| Age | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 12 | 17.50 | 18.75 | 19.00 | 19.25 | 19.50 | 19.75 | 20.00 | 20.25 | 20.50 | 20.75 | 21.00 | 21.25 | 21.50 | 21.75 | 22.00 | 22.25 | 22.50 | 22.75 | 23.00 | 23.25 | 23.50 | 23.75 | 24.00 | 24.25 | 24.50 | 24.75 | 25.00 | 25.25 | 25.50 | 25.75 | 26.00 | 26.25 | 26.50 | 26.75 | 27.00 | 27.25 | 27.50 | 27.75 | 28.00 | 28.25 | 28.50 | 28.75 | 29.00 | 29.25 | 29.50 | 29.75 | 30.00 | 30.25 | 30.50 | 30.75 | 31.00 | 31.25 | 31.50 | 31.75 | 32.00 | 32.25 | 32.50 | 32.75 | 33.00 | 33.25 | 33.50 | 33.75 | 34.00 | 34.25 | 34.50 | 34.75 | 35.00 | 35.25 | 35.50 | 35.75 | 36.00 | 36.25 | 36.50 | 36.75 | 37.00 | 37.25 | 37.50 | 37.75 | 38.00 | 38.25 | 38.50 | 38.75 | 39.00 | 39.25 | 39.50 | 39.75 | 40.00 | 40.25 | 40.50 | 40.75 | 41.00 | 41.25 | 41.50 | 41.75 | 42.00 | 42.25 | 42.50 | 42.75 | 43.00 | 43.25 | 43.50 | 43.75 | 44.00 | 44.25 | 44.50 | 44.75 | 45.00 | 45.25 | 45.50 | 45.75 | 46.00 | 46.25 | 46.50 | 46.75 | 47.00 | 47.25 | 47.50 | 47.75 | 48.00 | 48.25 | 48.50 | 48.75 | 49.00 | 49.25 | 49.50 | 49.75 | 50.00 | 50.25 | 50.50 | 50.75 | 51.00 | 51.25 | 51.50 | 51.75 | 52.00 | 52.25 | 52.50 | 52.75 | 53.00 | 53.25 | 53.50 | 53.75 | 54.00 | 54.25 | 54.50 | 54.75 | 55.00 | 55.25 | 55.50 | 55.75 | 56.00 | 56.25 | 56.50 | 56.75 | 57.00 | 57.25 | 57.50 | 57.75 | 58.00 | 58.25 | 58.50 | 58.75 | 59.00 | 59.25 | 59.50 | 59.75 | 60.00 | 60.25 | 60.50 | 60.75 | 61.00 | 61.25 | 61.50 | 61.75 | 62.00 | 62.25 | 62.50 | 62.75 | 63.00 | 63.25 | 63.50 | 63.75 | 64.00 | 64.25 | 64.50 | 64.75 | 65.00 | 65.25 | 65.50 | 65.75 | 66.00 | 66.25 | 66.50 | 66.75 | 67.00 | 67.25 | 67.50 | 67.75 | 68.00 | 68.25 | 68.50 | 68.75 | 69.00 | 69.25 | 69.50 | 69.75 | 70.00 | 70.25 | 70.50 | 70.75 | 71.00 | 71.25 | 71.50 | 71.75 | 72.00 | 72.25 | 72.50 | 72.75 | 73.00 | 73.25 | 73.50 | 73.75 | 74.00 | 74.25 | 74.50 | 74.75 | 75.00 | 75.25 | 75.50 | 75.75 | 76.00 | 76.25 | 76.50 | 76.75 | 77.00 | 77.25 | 77.50 | 77.75 | 78.00 | 78.25 | 78.50 | 78.75 | 79.00 | 79.25 | 79.50 | 79.75 | 80.00 | 80.25 | 80.50 | 80.75 | 81.00 | 81.25 | 81.50 | 81.75 | 82.00 | 82.25 | 82.50 | 82.75 | 83.00 | 83.25 | 83.50 | 83.75 | 84.00 | 84.25 | 84.50 | 84.75 | 85.00 | 85.25 | 85.50 | 85.75 | 86.00 | 86.25 | 86.50 | 86.75 | 87.00 | 87.25 | 87.50 | 87.75 | 88.00 | 88.25 | 88.50 | 88.75 | 89.00 | 89.25 | 89.50 | 89.75 | 90.00 | 90.25 | 90.50 | 90.75 | 91.00 | 91.25 | 91.50 | 91.75 | 92.00 | 92.25 | 92.50 | 92.75 | 93.00 | 93.25 | 93.50 | 93.75 | 94.00 | 94.25 |

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|-----|-------|------|-------|------|-------|
| 013 | 24.75 | 0312 | 12.90 | 1250 | 49.50 |
| 014 | 24.00 | 3113 | 10.85 | 1251 | 55.50 |
| 014 | 24.00 | 0313 | 16.00 | 1301 | 7.00 |
| 018 | 30.00 | 3114 | 11.75 | 1302 | 8.60 |
| 018 | 30.00 | 0314 | 17.50 | 1303 | 10.45 |
| 019 | 33.30 | 3115 | 20.50 | 1304 | 11.35 |

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|----|-------|------|-------|----------------------|-------|
| 23 | 20 | 316 | 23.50 | 131.1 | 7.75 |
| 24 | 17.75 | 316 | 23.50 | 131.2 | 9.50 |
| 24 | 14.40 | 0321 | 13.15 | 131.3 | 11.35 |
| 25 | 30.45 | 0322 | 14.40 | 131.4 | 12.25 |
| 25 | 30.45 | 0323 | 17.50 | 155.2 | 5.25 |
| 27 | 25.00 | 324 | 18.75 | 155.2 ^{1/2} | 7.75 |
| 28 | 9.75 | 0324 | 18.75 | 160.5 | 4.90 |
| 29 | 10.50 | 340 | 3.75 | 160.7 | 5.55 |
| 30 | 15.75 | 343 | 15.00 | 160.7 ^{1/2} | 8.60 |
| 31 | 12.25 | 344 | 10.20 | 160.7 ^{1/2} | 11.60 |

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|--------------------------------|-------|------|-------|------|-------|
| 31 ¹ / ₂ | 27.00 | 350 | 5.55 | 1610 | 14.00 |
| 31 ³ / ₂ | 30.40 | 353 | 16.00 | 1612 | 16.00 |
| Per Set | | | | | |
| 32 B | 20.25 | 354 | 17.50 | 1613 | 7.50 |
| 32 E P | 27.00 | 355 | 20.50 | 1614 | 9.50 |
| 32 H P | 51.25 | 360 | 7.50 | 1660 | 10.00 |
| 33 B | 24.30 | 361 | 12.00 | 1661 | 12.50 |
| | | 0361 | 10.00 | 1801 | 7.30 |

[illegible]

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|----------|-------|-----|-------|------|-------|
| 039 B | 4.50 | 438 | 22.50 | 1867 | 11.15 |
| 039 2 B | 3.05 | 439 | 25.00 | 1870 | 11.70 |
| Per doz. | 4.60 | 22 | 15 | 1871 | 15.90 |
| 39 | 13.50 | 461 | 18.40 | 1872 | 17.70 |
| 40 | 1.90 | 405 | 53.55 | 1873 | 21.90 |
| 40 2 | 1.90 | 538 | 8.15 | 1880 | 14.15 |

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|----|-------|-----|-------|------|-------|
| 12 | 5.5 | 539 | 4.05 | 1881 | 18.55 |
| 14 | 7.00 | 543 | 23.00 | 1882 | 20.15 |
| 14 | 10.20 | 544 | 11.00 | 1883 | 24.55 |
| 16 | 17.50 | 544 | 12.10 | 2260 | 9.75 |
| 16 | 45.00 | 545 | 12.60 | 2261 | 11.00 |
| 16 | 65.00 | 545 | 18.10 | 2262 | 11.25 |
| 17 | 33.00 | 546 | 23.35 | 2263 | 12.50 |
| 18 | 9.25 | 546 | 20.85 | 2270 | 11.75 |
| 20 | 10.50 | 548 | 18.55 | 2271 | 13.00 |

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|----|-------|------|-------|------|-------|
| 13 | 17.0 | 540% | 17.05 | 2272 | 14.75 |
| 13 | 11.05 | 548% | 11.05 | 2273 | 16.00 |
| 14 | 16.90 | 550% | 3.55 | 2400 | 65.00 |
| 15 | 22.50 | 550% | 5.45 | 2401 | 73.40 |
| 17 | 31.95 | 551% | 4.05 | 2402 | 49.50 |
| 17 | 31.95 | 551% | 2.75 | 2403 | 43.90 |
| 18 | 20.00 | 551% | 5.05 | 2404 | 53.00 |

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|----|-------|------|-------|------|-------|
| 0. | 3. | 552 | 3.25 | 2405 | 61.40 |
| 0. | 2.80 | 0552 | 3.50 | 2407 | 56.24 |
| 1. | 4.05 | 5521 | 7.75 | 2430 | 59.50 |
| 2. | 7.50 | 603 | 10.00 | 2431 | 69.50 |
| 3. | 9.00 | 604 | 3.25 | 2432 | 50.50 |
| 4. | 11.00 | 604 | 2.75 | 2436 | 28.50 |
| 5. | 13.75 | 605 | 4.00 | 2437 | 31.00 |
| 1. | 8.50 | 606 | 4.05 | 2438 | 22.50 |
| 2. | 5.60 | 0606 | 4.05 | 2439 | 25.00 |

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|----|----|------|-------|------|-------|
| 3 | 12 | 607 | 5.35 | 2450 | 25.00 |
| 3 | 13 | 607½ | 11.60 | 2457 | 31.00 |
| 73 | 13 | 608 | 9.35 | 2470 | 50.00 |
| 4 | 5 | 608½ | 13.25 | 2471 | 40.75 |
| 6 | 19 | 612 | 6.40 | 2480 | 28.75 |
| 7 | 17 | 612½ | 4.90 | 2481 | 31.75 |
| 8 | 23 | 613 | 7.50 | 2489 | |

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|----|-------|------|-------|------|-------|
| 9. | 17.30 | 613½ | 0.00 | 2402 | 34.75 |
| 0. | 0.03 | 614 | 0.50 | 2403 | 25.00 |
| 1. | 7.00 | 614½ | 7.95 | 2401 | 28.00 |
| 4½ | 21.25 | 615 | 17.00 | 2501 | 95.05 |
| 5. | 35.00 | 615½ | 15.00 | 2500 | 66.05 |
| 6. | 4.05 | 622 | 15.00 | 2502 | 66.05 |
| 7. | 7.85 | 623 | 17.20 | 2550 | 99.40 |

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|-----------------|-------|-------------------|-------|------|-------|
| 8. | 8.1 | 690 | 3.25 | 2511 | 59.40 |
| 9. | 9.25 | 630 | 4.75 | 2512 | 59.40 |
| 2. | 53.50 | 630 $\frac{1}{2}$ | 3.25 | 2515 | 64.80 |
| 3. | 6.50 | 631 | 10.80 | 2516 | 64.80 |
| 0. | 2.80 | 632 | 13.50 | 2517 | 64.80 |
| 0 $\frac{1}{2}$ | 4.25 | 650 | 3.25 | 2560 | 81.00 |
| 0. | 68.15 | 651 | 4.75 | 2561 | 81.00 |

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|----------|--------|-----------|-------|-----------|-------|
| 101..... | 95.50 | 052..... | 3.25 | 2502..... | 81.00 |
| 05..... | 52.50 | 053..... | 4.75 | 2012..... | 6.40 |
| 10..... | 91.95 | 055..... | 10.20 | 2013..... | 10.15 |
| 15..... | 71.60 | 061½..... | 11.25 | 2014..... | 14.00 |
| 121..... | 132.45 | 065..... | 34.20 | 2024..... | 41.00 |
| 122..... | 132.45 | 065½..... | 30.75 | 2025..... | 43.50 |
| 31..... | 120.00 | 066..... | 85.40 | 2027..... | 31.00 |

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|------|--------|------|-------|-------|-------|
| 140 | 162 | 666½ | 00.05 | 2627½ | 33.50 |
| 140½ | 70.50 | 670 | 19.25 | 2661 | 13.50 |
| 141 | 98.00 | 671 | 27.00 | 2666 | 19.50 |
| 142 | 98.00 | 672 | 34.20 | 8180 | 55.05 |
| 150 | 93.95 | 675 | 38.45 | 8180½ | 42.50 |
| 154 | 105.95 | 676 | 44.45 | 8181 | 60.65 |
| 61 | 88.15 | 677 | 44.45 | 8181½ | 47.50 |

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|----------|--------|-------------------------|-------|-------------------------|-------|
| 172..... | 116.50 | 678..... | 50.40 | 818 $\frac{1}{2}$ | 60.65 |
| 173..... | 125.00 | 685..... | 45.00 | 818 $\frac{1}{2}$ | 45.00 |
| 174..... | 37.50 | 692..... | 22.50 | 818 $\frac{1}{2}$ | 65.65 |
| 175..... | 50.00 | 693..... | 23.75 | 818 $\frac{1}{2}$ | 50.00 |
| 176..... | 67.50 | 693 $\frac{1}{2}$ | 34.60 | 824 $\frac{1}{2}$ | 14.40 |
| 177..... | 90.00 | 693 $\frac{3}{4}$ | 48.05 | 824 $\frac{1}{2}$ | 16.85 |
| 178..... | 90.00 | 694..... | 55.00 | 8303..... | 12.50 |

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| 30 | 53.1 | 695 | 65.00 | 8304 | 14.10 |
| 30½ | 39.40 | 712 | 17.50 | 8313 | 13.45 |
| 31 | 58.10 | 713 | 18.75 | 8314 | 15.20 |
| 31½ | 44.40 | 713½ | 21.75 | | Per set. |
| 32 | 58.10 | 713¾ | 24.75 | 8332½ | 7.50 |
| 32½ | 44.40 | 718 | 30.00 | 8332¾ | 6.25 |
| 33 | 63.10 | 725 | 55.80 | 8333½ | 9.00 |

| Per doz. | |
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| 34 | 49.4 |
| 34 | 63.15 |
| 34 1/2 | 47.50 |
| 35 | 68.15 |
| 35 1/2 | 52.50 |
| 36 | 71.15 |
| 36 1/2 | 48.40 |
| 36 1/2 | 34.80 |
| 37 | 77.00 |
| 37 1/2 | 70.00 |
| 38 | 70.00 |
| 38 1/2 | 70.00 |
| 39 | 80.00 |
| 39 1/2 | 80.00 |
| 40 | 88.00 |
| 40 1/2 | 88.00 |
| 41 | 88.00 |
| 41 1/2 | 88.00 |
| 42 | 88.00 |
| 42 1/2 | 88.00 |
| 43 | 88.00 |
| 43 1/2 | 88.00 |
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| 96 1/2 | 88.00 |
| 97 | 88.00 |
| 97 1/2 | 88.00 |
| 98 | 88.00 |
| 98 1/2 | 88.00 |
| 99 | 88.00 |
| 99 1/2 | 88.00 |
| 100 | 88.00 |

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|-----|-------|-----|-------|------|-------|
| 157 | 34.0 | 802 | 0.85 | 8802 | 10.25 |
| 157 | 53.40 | 802 | 8.85 | 8821 | 18.00 |
| 157 | 39.80 | 805 | 10.60 | 8822 | 22.85 |
| 0% | 5.55 | 806 | 12.10 | 8861 | 13.25 |
| 40% | 5.55 | 807 | 14.60 | 8862 | 16.85 |
| 1% | 7.40 | 810 | 13.75 | 8866 | 15.65 |
| 0% | 4.15 | 811 | 15.75 | 8867 | 20.45 |

| Patent Steel Keys, Nickel Plates. | | | | | |
|-----------------------------------|----------|----------|--------|----------|-----------------|
| Class. | Pr. doz. | | Class. | Per doz | Class. Per doz. |
| 8.... | 4.85 | 410½ | 6.65 | 427..... | 3.40 |
| 9.... | 4.85 | 411..... | 6.65 | 428..... | 3.40 |
| | 4.85 | 411½ | 6.65 | | |

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|-----------------|------|-------------------|------|-----|------|
| 2. | 0.65 | 412 | 6.65 | 429 | 3.40 |
| 2 $\frac{1}{2}$ | 0.65 | 412 | 6.65 | 430 | 3.40 |
| 3. | 0.65 | 413 | 6.65 | 431 | 3.40 |
| 3 $\frac{1}{2}$ | 0.65 | 418 | 4.85 | 434 | 3.40 |
| 4. | 0.65 | 421 | 4.85 | 435 | 3.40 |
| 4 $\frac{1}{2}$ | 2.95 | 422 | 4.85 | 440 | 3.60 |
| 5. | 2.95 | 422 $\frac{1}{2}$ | 4.85 | 450 | 7.50 |
| 5 $\frac{1}{2}$ | 2.95 | 423 $\frac{1}{2}$ | 4.85 | 451 | 7.50 |

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|-----|------|------|------|------|------|
| 0.4 | 2.95 | 423 | 4.45 | 453 | 7.50 |
| 0.6 | 2.95 | 424 | 4.45 | 453 | 7.50 |
| 0.8 | 2.95 | 424½ | 4.85 | 453½ | 7.50 |
| 1.0 | 2.95 | 424½ | 4.85 | 455 | 7.50 |
| 1.2 | 2.95 | 425 | 3.40 | 450 | 7.50 |
| 1.4 | 2.95 | 425½ | 3.40 | 457 | 7.50 |
| 1.6 | 2.95 | 425½ | 3.40 | 458 | 7.50 |

| | | | | | |
|---------|------|-----------|------|----------|------|
| 0..... | 2.95 | 425½..... | 3.40 | 459..... | 7.50 |
| 9½..... | 2.05 | 42¾..... | 3.40 | 460..... | 7.50 |
| 0..... | 6.65 | 420..... | 4.85 | 461..... | 7.50 |

IRON.

American Pig.—The improved inquiry for raw Irons, noticed in our issue of last week, has in the interval been still further stimulated, and the market may be fairly stated active and in sellers' favor. The disposition to secure supplies for future delivery is very manifest, and in many instances makers refuse to name a price for next year. During the week very large contracts have been made by the Thomas Iron Co. for 1880 delivery at \$28, \$29 and \$30 for Gray Forge, 2 X and No. 1 Foundry. We hear also of several 100-ton lots being sold for prompt delivery on the same basis. We quote: Foundry No. 1, \$30; Foundry No. 2, \$29; and Gray Forge, \$28.

Scotch Pig.—About 5000 tons of foreign Pig Iron reached this port during the week. Sales since our last have been light, no large parcels changing hands. As regards values the tone of the market has gained strength, and some brands are quoted fully \$1 per ton advance on the figures current a week ago. We quote: Eglinton, \$24.50 @ \$25; Summerlee, \$26.50; Coltness, \$28; Glangarnock, \$25.50, and Gartsherrie, \$25.50 @ \$26.

Rails.—Sales are reported of 4500 tons Steel Rails at \$65, at mill, and 7500 tons on private terms. For Iron Rails there is considerable inquiry, and we hear of sales of 7500 tons American and between 10,000 and 12,000 tons English, both on terms which have not been transpired. In addition to the above, a sale of a large lot in the West is reported at \$57.50, at mill. We quote Steel, \$65 @ \$70. English Iron Rails, \$55; and American, \$54 @ \$58.

Old Rails.—Old Rails are in very active request, and sales during the week, amounting to over 20,000 tons, at prices ranging from \$33 @ \$35, are reported. The market is strong and may be quoted \$32.50 @ \$35.

Scrap.—Scrap Iron does not move as freely as the other descriptions already noticed. The supply is good, and quotations from dock are \$32 @ \$32.50 for No. 1 Wrought; we quote the same from yard, \$35.

METALS.

Copper.—There has been little doing during the week under review, sales of Lake Superior being limited to 150,000 pounds at 21½¢, which is the ruling figure at the close, Baltimore being nominally quotable as much. No change is reported from London per cable; by mail we have the following, dated Dec. 6, and having reference to the statistics at the beginning of the month: "The total figures, including all kinds in England and Havre afloat and chartered, are 58,420 tons, against 55,658 tons on the 1st of November, or an increase of 2762 tons to be brought over from last month. These figures do not comprise the whole public stock of Chile produce, as there is some quantity of ingots lying at the railway depots at Birmingham, and we would respectfully suggest to the compilers of statistics, to whom the whole trade are greatly indebted for the very valuable information they have hitherto rendered, whether the returns would not be more complete if the Birmingham stock were included. The present statistics will doubtless be deemed unsatisfactory, for with the exception of those on the 1st of September last, viz., 59,169 tons, they are the next largest on record, but then the price of Chile bars was only \$54. 5/8, whereas on the 1st inst. it was quoted 266. 10/8, or about £12 3/4 ton dearer. No important events are telegraphed from the West Coast. There was some report that Chile may be induced to detach Bolivia from the alliance with Peru, and conclude a separate peace with her at the expense of the latter. A local circular says: "The consumption of this metal has increased in 1879 over 60%. The production of Lake Copper is estimated at 40,000,000 pounds, while it is asserted the Copper consumption will, in the United States, exceed 64,000,000 pounds from July 1, 1879, to July 1, 1880. Estimating the consumption of 1878 to have been 40,000,000 pounds, an increase of consumption in 1879 of 60% would make the consumption of the year to be at least 64,000,000 pounds." We quote: Braziers' 30¢, and Bolts, 30¢. High Brass Rolls and Sheets, all numbers not thinner than No. 28, wider than 2 inches, not wider than 14 inches, 30¢, and 2¢ additional on each number thinner than No. 28 to No. 38, inclusive.

Tin.—The market here has become very quiet, and closes heavy at the following quotations for large lots: Straits, 21¢ @ 21½¢; English Refined, 21¢; ditto Common, 20½¢ @ 21¢; and Banca, 23¢ @ 24¢. London cables Straits \$20, and Singapore \$27.50 per cwt. Arrivals since our last report have been 8000 slabs Straits and 2000 ingots, Australian. "London, Dec. 6.—The sudden rise which took place in this market last week after the Dutch sale was almost as rapidly lost as it was gained, and on last Wednesday business was transacted as low as £80 for foreign, or £7 per ton less than the highest quotation on the previous Thursday; but the market soon rallied again, and yesterday it still further recovered, and £90. 5/10 to 10/ was officially quoted, and to-day's price is £90. 10/ to £91. The statistics published for last month are rather less favorable than those issued at the end of October, the total stock having increased to 15,087 tons against 14,418 tons, and 15,852 tons on the 30th of November, 1878, but the actual stock on the spot and landing has slightly diminished. The deliveries during last month were not much more than half what they were in October, being 1482 tons, against 2770 tons, and 1595 tons for the same period of last year. The shipments from Straits were 375 tons, and from Australia 1025 tons. Tin Plates.—The market here is strong, and prices are higher. We quote large lots, ordinary brands, per box: Charcoal Bright, \$7.87½ @ \$8.12½; ditto Termes, \$6.75 @ \$7; Coke Tin, \$7; and ditto Termes, \$6.25. Coke Tin has sold at \$6.75, deliverable dur-

ing the next three months; it is cabled 22/ from Liverpool. The market on the other side is equally strong, especially in view of the high ruling of the Iron market.

Lead.—The market has been quiet, rates not exceeding during the week a couple of hundred tons of Common Domestic, at 5½¢. We quote the latter 6.60¢ @ 5½¢, nominal. Of Foreign Lead, 100 tons sold at 6¢. The late destructive floods on the Isthmus of Panama, breaking up freight traffic for the time, caused some 400 to 500 tons of Lead, intended for New York, to be returned to San Francisco as ballast. "London, Dec. 6.—This metal has still further advanced in value, and a fair demand exists among home consumers, but shipments to China and other foreign markets keep very limited. English Pigs are now quoted up to £18, and Sheet Lead at about £1 per ton higher." Manufacturers' prices remain as last noted. We quote: Bar, 6½¢; Pipe, 7½¢; Sheet, 8¢; Tin-lined Pipe, 15¢, all less 10% to the trade. No. 1 Solder, 12¢.

Spelter and Zinc.—We have relapsed here into a very quiet state of affairs, the few sales of Common Domestic transpiring being effected at 6¢ @ 6½¢. Silesian at present prices is less eagerly bought. We quote the latter, nominally, 6½¢ @ 6½¢, and Bergenport from Leigh 10¢ 10¢. "London, December 6.—The market for this metal remains steady, ordinary Silesian brands offering at £10. 12/6 to 15/." English Hard continues in but slight request at previous quotations." American Sheet Zinc, 8¢ @ 8½¢.

Nickel.—Remains unaltered at \$1.40.

Antimony.—No change can be reported in this metal, which remains steady at 16¢ @ 20¢, according to brand.

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Dec. 16, 1879:

| Hardware. | Sheets, 48" |
|-------------------------|-------------------------|
| Baldwin Bros. & Co. | Sheet iron, bbls., 771 |
| Hdw. pgs., 5 | Spinney J. |
| Barclay & Livingston. | Old iron, a lot |
| Grindstones, 50 | Standard Oil Co. |
| Baker & Hermann & Co. | Hoops, bbls., 2907 |
| Hdw., cs., 7 | Stephens & Reynolds. |
| Hdw., cs., 17 | Old rails, tons, 391 |
| Brackner & Evans. | Whitney A. R. |
| Galvanized wire net- | Bars, 312 |
| ting, rolls, 25 | Pig, tons, 10 |
| Buckley J. H. & Son. | Sheets, 1481 |
| Machinery, cs., 2 | Wm. J. & Co. |
| Burkshaw W. C. | Pk. tons, 300 |
| Hdw., cs., 2 | Wolff, R. H. & Co. |
| Curley J. & Bro. | Rod iron, lots, 248 |
| Cutlery, cs., 5 | Order. |
| Cutlery, cs., 1 | Bar iron, bbls., 947 |
| Dale John G. | Bars, 11,064 |
| Hdw., pgs., 4 | Fish plates, kilos., |
| Machinery, pgs., 2 | 995 |
| De Witt Wire Cloth Co. | Hoop iron, bbls., 123 |
| Mdse., pgs., 1 | Iron, sheets, 129 |
| Dreyfuss, Weiler & Co. | Oil barrel hoops, |
| Hdw., cs., 4 | 2907 |
| Ferris F. J. & Co. | Old chains, tons, 100 |
| Hdw., cs., 2 | Old bars, a quantity |
| Graef Cutlery Co. | Old rails, 3393 |
| Mdse., pgs., 6 | Old rails, kilos., 989 |
| Henderson Bros. | Old rails, pieces, 3366 |
| Hdw., pgs., 7 | Old rails, pcs., 272 |
| Hermann H. & Co. | Old rails, tons, |
| Mdse., pgs., 1 | 41334 |
| Howard Bros. & Reid, | Old scrap rail iron, |
| rdw., cs., 1 | tons, 200 |
| Leigh Lewis. | Ore, tons, 565 |
| Machinery, cs., 2 | Pig, tons, 4707½ |
| Lockwood A. J. | Scrap, a lot |
| Files, cs., 2 | Scrap, kilos., 81,638 |
| Mason J. W. & Co. | Scrap, tons, 167 |
| Wire rope, coils 3 | Sheet iron, bbls., 216 |
| McAndrews J. C. | Sheet iron, bbls., |
| Emery stone, tons, | 116 |
| Thyra emery stone, | Spiegelstein, kilos., |
| tons, 44 | 465,750 |
| McCoy & Co. | Spiegelstein, tons, |
| Hdw., cs., 1 | 669 |
| Hdw., cs., 7 | Wire rods, bbls., 211 |
| McKinless John A. | Wire rods, pgs., 1500 |
| Hdw., cs., 1 | |
| Menendez Jones. | |
| Wire, cs., 2 | |
| Merchants Dispatch Co. | |
| Guns, cs., 4 | |
| Meriden Britannia Co. | |
| Mdse., pgs., 6 | |
| Milliken & Smith. | |
| Wire, bbls., 1051 | |
| Moore Henry. | |
| Files, cs., 5 | |
| Moulson John. | |
| Hdw., cs., 1 | |
| Mout James T. | |
| Lead, bars, 298 | |
| Perkins & Co. | |
| Cannel coal, tons, 100 | |
| Rubber Comb Co. | |
| Hdw., cs., 1 | |
| Schuyler, Hartley & | |
| Graham. | |
| Guns, cs., 2 | |
| Stewart A. T. & Co. | |
| Machinery, cs., 3 | |
| Tillotson L. G. & Co. | |
| Galvanized wire, lots, | |
| 200 | |
| Twiss Henry J. | |
| Cutlery, cs., 1 | |
| Wallach A. & E. | |
| Hdw., cs., 2 | |
| Ward Asstine. | |
| Hdw., cs., 1 | |
| Wetzlar M. | |
| Mdse., pgs., 2 | |
| Wiebusch & Hilger Hdw. | |
| Co. | |
| Cutlery and hdw., | |
| pgs., 37 | |
| Willis. | |
| Machinery, cs., 2 | |
| Wolf H. & Co. | |
| Mdse., pgs., 1 | |
| Order. | |
| Anvils, 185 | |
| Arms, cs., 2 | |
| Chains, cs., 37 | |
| Gun barrels, cs., 1 | |
| Hdw., cs., 15 | |
| Hdw., pgs., 3 | |
| Machinery, cs., 16 | |
| Nails, cs., 2 | |
| Round Cannel coal, | |
| tons, 102 | |
| Wire, cs., 1 | |
| Carpenter J. O. | |
| Bars, 56 | |
| Corbin F. & F. | |
| Pig, tons, 10 | |
| Drexler, Morgan & Co. | |
| Hoops, bbls., 5904 | |
| Lee, Jas. & Co. | |
| Bars, 23 | |
| Pig, tons, 200 | |
| Morton, Bliss & Co. | |
| Old Rails, 3577 | |
| Mulenchy & Hopkins. | |
| Sheet iron, bbls., 84 | |
| tons, 102 | |
| Netherlands Trading So- | |
| ciety | |
| Old rails, 3150 | |
| Old rails, kilos., 200 | |
| Ogden & Wallace. | |
| Bar iron, bbls., 512 | |
| Pionson & Co. | |
| Bars, 6862 | |

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending December 16, 1879:

| Danish West Indies. | Quanz. Val. |
|----------------------------------|-------------|
| Glassware, cs., 17 | \$412 |
| Ptms., gals., 3900 | 504 |
| Hdw., cs., 63 | 694 |
| Nails, kegs, 72 | 375 |
| Carriages, 7 | 115 |
| Mach. oil, gals., 200 | 160 |
| Hamburg. | |
| Mach. oil, bbls., 2150 | 2150 |
| Sew. mach., cs., 49 | 6,085 |
| Mf. iron, pgs., 13 | 566 |
| Hdw., cs., 50 | 1,206 |
| Bolting, bales, 3 | 898 |
| Mach. cs., 3 | 4,285 |
| Ag. imp., pgs., 208 | 9,918 |
| Ptms., gals., 187,006 | 16,360 |
| Antwerp. | |
| Ag. imp., pgs., 9 | 483 |
| Ore, tons, 131 | 788 |
| Hdw., cs., 36 | 453 |
| Lub. oil, bbls., 2,891 | |
| Rotterdam. | |
| Ptms., gals., 519,244 | 40,460 |
| Lub. oil, gals., 3833 | 556 |
| Bristol. | |
| Reaper, 1 | 150 |
| Hdw., cs., 22 | 549 |
| Ptms., gals., 308,584 | 20,807 |
| Bremen. | |
| Ptms., gals., 1,785,252 | 136,740 |
| Lub. oil, gals., 827 | 4,164 |
| Tinware, pgs., 2 | 297 |
| Glassware, pgs., 4 | 125 |
| Mf. iron, pgs., 4 | 58 |
| Tinware, pgs., 28 | 753 |
| Sew. mach., 2 | 150 |
| Dutch West Indies. | |
| Ptms., gals., 2371 | 289 |
| Glassware, pgs., 14 | 101 |
| Tinware, pgs., 2 | 297 |
| Saddlery, case, 1 | 42 |
| Hdw., pgs., 35 | 512 |
| Pumps, pgs., 2 | 70 |
| Revolvers, bxs., 2 | 55 |
| Sew. mach., 16 | 536 |
| Hull. | |
| Ptms., gals., 141,514 | 13,000 |
| Gibraltar. | |
| Ptms., gals., 110,110 | 11,500 |
| British Possessions. | |
| in Africa. | |
| Ptms., gals., 5500 | 1,159 |
| Carriages, 27 | 6,260 |
| Ag. imp., pgs., 21 | 4,170 |
| Mach. pgs., 109 | 780 |
| Hdw., pgs., 369 | 5,083 |
| Cette. | |
| Ptms., gals., 101,578 | 9,187 |
| Liverpool. | |
| Bolting, cs., 4 | 1,438 |
| Brit. ware, cs., 1 | 175 |
| Silverware, cs., 2 | 250 |
| Ptms., gals., 73,776 | 53,691 |
| Sew. mach., cs., 2 | 123 |
| Ptmdware, cs., 2 | 290 |
| Wringers, cs., 21 | 420 |
| Hdw., cs., 107 | 7,071 |
| Mach. cs., 42 | 3,800 |
| Wire rope, tons, 3 | 300 |
| Metal yds, cs., 2 | 200 |
| Brake flat, cs., 4 | 400 |
| British North American Colonies. | |
| Coal, tons, 200 | 650 |
| Glassware, cs., 54 | 375 |
| Mach. cs., 10 | 1,300 |
| Mf. iron, pgs., 7 | 100 |
| Sew. mach., cs., 10 | 160 |
| British East Indies. | |
| Ptms., gals., 230,000 | 24,180 |
| Noradane. | |
| Ptms., gals., 70,100 | 8,000 |
| British West Indies. | |
| Nails, kegs, 132 | 600 |
| Notions, cs., 9 | 372 |
| Hdw., cs., 113 | 1,421 |
| Wire rope, tons, 3 | 300 |
| Mach. pgs., 109 | 780 |
| Ag. imp., pgs., 21 | 4,170 |
| Ptms., gals., 101,578 | 9,187 |
| Carriages, 27 | 6,260 |
| Ag. imp., pgs., 21 | 4,170 |
| Sew. mach., cs., 2 | 123 |
| Brit. ware, cs., 1 | 175 |
| Guns, case, 1 | 79 |
| Porto Rico. | |
| Ptms., gals., 8617 | 1,063 |
| Ag. imp., pgs., 6 | 144 |
| Carriages, 27 | 6,260 |
| Cop. pipes, cs., 1 | 338 |
| Glassware, cs., 5 | 91 |
| Pumps, pgs., 2 | 49 |
| RR cars, 228 | 1,737 |
| Nails, kegs, 132 | 600 |
| Notions, cs., 9 | 372 |
| Sew. mach., cs., 2 | 123 |
| Hdw., cs., 113 | 1,421 |
| Wire rope, tons, 3 | 300 |
| Mach. pgs., 109 | 780 |
| Ag. imp., pgs., 21 | 4,170 |
| Ptms., gals., 101,578 | 9,187 |
| Carriages, 27 | 6,260 |
| Ag. imp., pgs., 21 | 4,170 |
| Sew. mach., cs., 2 | 123 |
| Brit. ware, cs., 1 | 175 |
| Guns, case, 1 | 79 |
| Sancti Spiritus. | |
| Ptms., gals., 70,000 | 7,250 |
| Hdw., cs., 10 | 200 |
| Cadiz. | |
| Rifles, case, 1 | 50 |
| Ptms., gals., 20,000 | 1,600 |
| Valencia. | |
| Ptms., gals., 116,780 | 12,650 |
| Venezuela. | |
| Glassware, cs., 39 | 621 |
| Sew. mach., cs., 1 | 123 |
| Carriages, 27 | 6,260 |
| Nails, kegs, 132 | 600 |
| Slates, cs., 12 | 58 |
| Shoe nails, cs., 6 | 1,322 |
| Firearms, cs., 1 | 70 |
| Spikes, kegs, 10 | 30 |
| Carriage, 1 | 334 |
| Mach. pgs., 14 | 424 |
| Cutlery, cs., 6 | 184 |
| Pumps, pgs., 2 | 111 |
| Hdw., cs., 58 | 1,037 |
| Revolvers, cs., 3 | 1,052 |
| Ptms., gals., 9482 | 1,151 |
| Mf. iron, pgs., 107 | 780 |
| Tacks, case, 1 | 48 |
| Ciudad Republic. | |
| Ptms., gals., 50,000 | 5,850 |
| Hdw., cs., 34 | 605 |
| Sew. mach., cs., 7 | 300 |
| Ptmdware, pgs., 3 | 373 |
| Carriages, 27 | 6,260 |
| Glassware, cs., 5 | 88 |
| Sandpaper, cs., 1 | 55 |
| Ag. imp., pgs., 112 | 1,175 |
| Mach. pgs., 3 | 150 |
| Revolvers, cs., 3 | 1,052 |
| Ptms., gals., 9482 | 1,151 |
| Mf. iron, pgs., 107 | 780 |
| Tacks, case, 1 | 48 |
| Argentina Republic. | |
| Ptms., gals., 16,640 | |
| Carriages, cs., 16 | 640 |

OLD METALS, PAPER STOCK, &c.

There is no change to report in the Old Metal market since our last review. Business continues dull and no improvement is anticipated until after the first of the year.

The Rag and Paper Stock market remains active at our former quotations. The purchasing prices offered by dealers for Old Metals are as follows:

| | |
|---|------------------|
| Copper, heavy, per lb., \$0.175 @ \$0.185 | |
| Copper, bottom, " " " " | \$0.15 @ \$0.16 |
| Yellow Metal, " " " " | \$0.12 @ \$0.13 |
| Brass, light, " " " " | \$0.10 @ \$0.11 |
| Composition, heavy, " " " " | \$0.15 @ \$0.16 |
| Lead, solid, " " " " | \$0.04 @ \$0.04½ |
| Tin Lead, " " " " | \$0.03½ @ \$0.04 |
| Pewter, No. 1, " " " " | \$0.11 @ \$0.12 |
| Pewter, No. 2, " " " " | \$0.07 @ \$0.08 |
| Wrought Iron, per ton, 28.00 @ \$31.00 | |
| Light do., " " " " | 16.00 @ 18.00 |
| Stove Plate, " " " " | 12.50 @ 15.00 |
| Machinery do., " " " " | 15.00 @ 18.00 |

The prices current for Rags, &c., are as follows:

| | |
|-----------------------------------|-----------|
| Canvas, Linen, per lb., 1½¢ @ 2½¢ | |
| White Cotton, No. 1, " " " " | 4½¢ @ 5½¢ |
| White, No. 2, " " " " | 4½¢ @ 5½¢ |
| No. 3, " " " " | 3½¢ @ 4½¢ |
| Seconds, " " " " | 2½¢ @ 3½¢ |
| Mixed, Woolen, " " " " | 2½¢ @ 3½¢ |
| Soft, " " " " | 2½¢ @ 3½¢ |
| Mixed Rags, " " " " | 2½¢ @ 3½¢ |
| Gunny bagging, " " " " | 3½¢ @ 4½¢ |
| Jute butts, " " " " | 2½¢ @ 3½¢ |
| Kentucky bagging, " " " " | 2½¢ @ 3½¢ |
| Book Stock, " " " " | 2½¢ @ 3½¢ |
| Newspapers, " " " " | 1½¢ @ 2½¢ |
| Waste Paper and Scraps, " " " " | 1½¢ @ 2½¢ |
| Kentucky Bale Rope, " " " " | 4½¢ @ 5½¢ |
| Tarred Shaking, " " " " | 1½¢ @ 2½¢ |
| Grass Rope, " " " " | 2½¢ @ 3½¢ |

COAL.

The trade during the past week has been very flat. The warm weather, and the fact that dealers are very well stocked, are some of the causes which have operated to produce this state of things. Only those are in the market who are pushed by some necessity and must have Coal at once. In the meantime the companies are stocking Coal and preparing for the usual suspension which marks the close of the year. The extremely warm weather has had its influence upon the retail trade and made it exceedingly dull; hence the retail dealers have not been in the market. The weekly product still keeps up to about 500,000 tons, at which rate it seems impossible for Coal to hold the present quotations. Dealers and the companies' agents are, however, very stiff, and nominally accept no reductions in prices quoted. As they have few customers, except, as we have seen, those who are forced into the market, the stiffness in prices is not a very difficult matter to keep up.

The daily papers are talking about an agreement among the companies to suspend operations from Christmas to the 5th of January. The reporters have apparently been very effectively "stuffed," and appear to look upon this arrangement as a sort of combination which will have an effect upon prices. A suspension of about this length is usually considered necessary at this time of year. Its effect upon the market may be put down as nothing. Quotations are unchanged. Lehigh Lump, \$4; Broken and Egg, \$3.60; Stove, \$4, and Chestnut, \$3.75. The softer coals are quoted about 40¢ @ 50¢ lower than these figures for the larger sizes. The Philadelphia and Reading quotations for Stove range from \$3.90 @ \$4.15. In general, quotations are merely nominal. Freighters are off a little. Harbor is quoted at about 18¢; Boston, \$1.60 @ \$1.65; Portland, \$1.35 @ \$1.40, and discharged New London, 65¢ @ 70¢; Providence, 80¢.

PHILADELPHIA.

Office of The Iron Age, 220 South Fourth St., Philadelphia, December 16, 1879.

Pig Iron.—We have to note increasing firmness in the tone of the Iron market, with sales to a very large amount, all at full prices. It is impossible to state what quantity has

no alternative; and it is not strange, therefore, that buyers are anxious to anticipate future wants, nor, on the other hand, that manufacturers are indifferent about selling. We repeat former quotations, that is, for small lots for immediate delivery, as follows: Merchant Bars, well assorted orders, 3¢, 60 days, 2 ¢ off for cash; Sheet Iron, \$4.50 for No. 24; Skelp Iron, \$3.50; Plate Iron, \$3.80 to \$4.00.

Nails.—The situation remains much the same, with the exception of a firmer feeling in sympathy with iron and a disposition to contract for future delivery, with a sale of 5000 kegs reported for delivery next year at card rates. We continue to quote at \$3.65, 60 days, 2 ¢ off for cash, and an abatement of 10¢ per keg on lots of 200 kegs and upward.

Horse and Mule Shoes.—The demand is light, as it always is this month, but prices are firm, with a tendency to go higher. We repeat former quotations, \$4 and \$5 per keg, respectively, in 100-keg lots.

Railway Spikes.—Are still quoted at 3½¢ per lb, 30 days, with considerable inquiry, particularly for future delivery. Bolts unchanged at 5¢. The indications are that there will be a very heavy demand all next year for railway supplies, as, in addition to stocks being light in hands of old companies, a great many new roads are contemplated.

Wrought Iron Pipe.—While the mills generally are still reported busy, orders are not coming forward near so freely as some time ago, and prices are easier, although unchanged. We continue to quote discount on Gas and Steam Pipe at 25 ¢. The discount on Bolier Tubes has been increased to 15 ¢ 20¢. Oil-Well Casing and Tubing unchanged. Tubing, 28¢ to 30¢ net. Casing, 85¢ net.

Rails.—The market for Steel Rails continues very firm, and while, so far as we can learn, there have been no recent sales here, it is doubtful whether purchases could be made under \$70, cash, at mill, for delivery next year. Steel Blooms and Steel Billets are also very firm and advancing. Old Iron Rails continue scarce, hardly any American offering, and foreign are higher. The latter may be quoted at \$37 @ \$38, delivered in Pittsburgh.

Steel.—Notwithstanding we are now in what is usually the dull season, there is no apparent abatement in the demand for Merchant Steel, and while prices remain unchanged, they are strong, with a tendency to advance, owing to the increasing cost of production.

Muck Bar.—There appears to have been but little done recently, as we have heard of no late sales, but prices are firm in sympathy with Pig Iron. The most of the mills have sufficient rolling capacity to absorb all the Muck Bar they can make, and this accounts for the limited offerings. We quote at \$50 @ \$53, cash, at mill, according to quality.

Scrap.—There is a continued good demand for Scrap Steel, and prices are firm, but unchanged. Car Springs, \$35, net; Car Axles, \$42 @ \$43, net. Scrap Iron is not so much inquired for, but the market is firmer in tone, in sympathy with Pig Iron. No. 1 Wrought Scrap, \$38 @ \$40, net; Boiler Plate, \$38 @ \$40, net; Machinery Metal, gross, \$25; Cast Borings, gross, \$17 @ \$18. Old Car Wheels are difficult to quote, as there have been no sales reported recently. We are cognizant of one lot on sale at \$34, gross.

Window Glass.—Notwithstanding the close of the year is so near at hand, there is still some inquiry; and so great has been the demand ever since the factories started up, September 1st, that there is scarcely any stock in first hands. Manufacturers are now very anxious to work up a stock for the spring trade, as one of them remarked the other day he did not care if he did not get a single order for two months. Prices are firm, but unchanged. Discounts 60 to 60 and 5 ¢. There is to be a meeting of the National Window Glass Association in Washington City next month, at which it is possible there will be some changes made in the card and discounts as well.

Coke.—There is no abatement in the demand. There are a good many wanting to make contracts for future delivery, which manufacturers, as a rule, are declining, unless at extreme prices, which no one seems willing to pay. The policy of the latter is to sell only for immediate or early delivery, so as to keep themselves in position to take advantage of an advance should it take place, as seems probable. Quotations may be fairly given at \$1.60 @ \$1.75 per ton, run of ovens, and \$1.90 for selected. Some, it is said, would not contract for future delivery at \$2.

Coal.—Since our report of last week, between 6,000,000 and 7,000,000 bushels have been started down the river, the most of it consigned to Southern markets. For the first time since last spring there was water enough to let out loaded boats, all former shipments during the time in question having been in barges. It is fortunate the rise came when it did, as the indications are that cold weather has come to stay, and we should not be surprised if the river should be full of ice, or, indeed, frozen over within the next week or two; moreover, the coal was badly needed in the down-river markets, as stocks of Pittsburgh coal are very much reduced, and then our coal men need the money. Another good effect of these recent large shipments is that it will afford employment for the miners.

Petroleum.—There has been nothing particularly important developed during the past week; business here in Pittsburgh has been less active, and prices have declined slightly. The situation, in one important respect, is less favorable. The shutting down of many of the refineries must reduce the consumption and increase the visible supply, which is very large. However, there are those who have confidence in the article; they predict that the production will fall off largely during the winter, and that prices, in consequence, will rule higher before spring. It is very evident, however, that speculators will do the most of the business for some time to come, and they may succeed in pulling prices higher—there is no telling.

CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., CHATTANOOGA, Dec. 15, 1879.

General business has, contrary to usual experience at this season, decidedly improved within the past week. The advance in metals in Great Britain, and the consequent slackening up of the importation business in that line, has already been felt in this district, and is imparting a firmer tone to the trade. The general activity in manufactures is on the increase, and more interest is manifested by parties having experience and capital than was ever known before. The growth seems a healthy one, the best evidence of which is the fact that the demand is greater than the supply, and the former grows faster than present or prospective plants increase the capacity of production. The weather has been wet and cool, and several severe storms of rain, accompanied by wind and thunder, have occurred. Streams are full and boatmen busy.

Pig Iron.—The market is decidedly firm. No concessions are asked, and none would be granted on quotations. We confidently look for an advance after the holidays. The feeling throughout the district is of the best, and buyers are more anxious than they were a week back to take large lots. We continue last quotations: Coke—No. 1 Foundry, \$28 @ \$30; No. 2, \$25 @ \$28; Gray Forge, \$28 @ \$30; White and Mottled, \$25. Hot-blast Charcoal—No. 1 Foundry, \$28 @ \$30; No. 2, \$25 @ \$28; Gray Forge, \$27 @ \$28. Cold-blast Charcoal—Car Wheel Metal, \$30 @ \$40.

Muck Bar, &c.—No Muck Bar in market. Old Rails continue nominal. Wrought Scrap, \$28 @ \$33; Old Car Wheels, \$25.

Ores.—Are in fair supply. Brown Hematite \$2 @ \$2.75 per ton, 50 to 56 ¢ Iron; Red Fossil, \$2 @ \$2.25 on cars or on wharf from barges.

Nails.—Continue strong, and the mills selecting their orders. We continue to quote \$3.75 rates.

Manufactured Iron.—There is no special activity in any line. All are firm at quotations, and plenty of work ahead at the mills. Bars at \$3.50; Railroad Spikes, \$3.40; Track Bolts, \$4.75; Trestle Bolts, \$5.50.

Coke.—Continues very strong. The Northern demand from Indiana and St. Louis is growing, and local consumers and projectors are likely to find some difficulty in securing supplies at living rates. There is much talk of extending the product, but so far it has been only talk. We quote Furnace at \$3.50 per ton; Washed Foundry, 12¢ per bushel.

Iron Rails.—Nominally are quotable at \$50 @ \$58 per ton. There are none here for transient buyers, contracts ahead covering the capacity of the Chattanooga and Atlanta mills.

Steel Rails.—Are in about the same situation as Iron. We quote at \$60 at the mill, and strong. Contracts could hardly be closed at that figure.

BOSTON.

DECEMBER 13.—The more confident tone and improved inquiry for American Pig Iron at the shipping ports is reflected at this point. But the large arrivals of Scotch and English Iron continue to weigh heavily upon the market, the receipts since our last report having footed up a total of 3460 tons. We quote shipping port prices of American Pig as follows: \$29 @ \$30 for No. 1 X; \$28 @ \$29 for No. 2 X; \$27 @ \$28 for Gray Forge, and \$26 for White and Mottled. For delivery next year an advance of \$1 @ \$2 per ton above these figures is demanded. Manufactured Iron is in moderate demand and prices well sustained. Copper is quiet and steady, and we continue to quote 21½¢ @ 21½¢ for Ingot. Manufacturers are without material change, and we continue to quote Copper Sheathing at 28¢; Braziers at 30¢; Bolts, 30¢; Bottoms, 35¢; American Yellow Metal Sheathing, 17¢ @ 18¢; Yellow Metal Bolts, 20¢, and English do., 13½¢ in bond. Antimony is quiet and steady at 17¢ @ 18¢. Lead is firm, and we quote 5½¢ for large lots of Pig, and the Boston store price is 6¢. Manufacturers are firm, quoting Lead Pipe, 7½¢; Tin-Lined Pipe, 15¢; Bar Lead, 7¢; Sheet Lead, 8¢; Block Tin Pipe, 40¢; all of these are subject to the usual trade or 10 ¢ discount. Spelter is a trifle easier, and in the absence of much demand is offered at 6¢ @ 6½¢. Tin continues dull at about 21½¢ @ 22¢ for Straits; Banca at 23½¢; and English L. & F. at 21½¢ @ 22¢.—Commercial Bulletin.

ST. LOUIS.

Messrs. CARD & HOFFER, under date of December 13, write as follows: Trade continues good for the season. Mill Irons are beginning to get scarce in this market, and unless there is an accumulation in the next 60 days, we expect better prices. We continue quotations of last week:

| CHARCOAL HOT BLAST. | |
|---------------------------------|----------------|
| Missouri..... | \$15.00 @ |
| Southern..... | 34.00 @ |
| Hanging Rock..... | None offering. |
| COKE AND COAL. | |
| Missouri..... | None offering |
| Southern, No. 1..... | 38.00 @ 33.00 |
| Ohio River, No. 1..... | 38.00 @ 33.00 |
| Jackson County, No. 1..... | 38.00 @ 33.00 |
| Hocking Valley, No. 1..... | 38.00 @ 33.00 |
| No. 2, \$1 to \$2 per ton less. | |
| COLD BLAST. | |
| Missouri..... | 35.00 @ 37.00 |
| Southern..... | 38.00 @ 40.00 |
| Ohio..... | 40.00 @ 42.00 |
| IRON ORE. | |
| Iron Mountain..... | 7.50 @ 8.00 |
| Southwest..... | 7.00 @ 7.50 |
| Ore for flux..... | 9.00 @ |

CINCINNATI.

Messrs. E. L. HARPER & Co., under date of Dec. 15, write as follows: An increased inquiry and freer movement, with generally firmer feeling, have been the most salient characteristics of the market during the week past. The impression is becoming stronger that now is a good time to replenish stocks. The decided upward tendency looked for about January 1 appears to have already set in, and it is generally believed that this movement will continue, the point of difference in the opinions of buyers and sellers being as to the point that will be reached.

HOT-BLAST FOUNDRY.

| | |
|----------------------------------|-----------------|
| Hanging Rock, C. C., No. 1..... | \$38.00 @ 42.00 |
| C. C., No. 2..... | 35.00 @ 38.00 |
| Southern C. C., No. 1..... | 35.00 @ 38.00 |
| No. 2..... | 35.00 @ 38.00 |
| Strong, Neutral Coke..... | 38.00 @ 39.00 |
| Fannie, American Scotch..... | 37.00 @ 38.00 |
| Hocking Valley S. C., No. 1..... | 37.00 @ 38.00 |
| No. 2..... | 35.00 @ 36.00 |
| Hanging Rock, S. C., No. 1..... | 35.00 @ 36.00 |
| No. 2..... | 33.00 @ 34.00 |
| Open Silver Gray..... | 37.00 @ 38.00 |

FORGE IRONS.

| | |
|--------------------------------------|---------------|
| Hanging Rock, C. C., Gray Forge..... | 38.00 @ |
| Coke..... | 35.00 @ 36.00 |
| Cold-Short, Gray Forge..... | 33.00 @ 36.00 |

CAR WHEEL AND MALLEABLE.

| | |
|--------------------|---------------|
| Hanging Rock..... | 47.00 @ 50.00 |
| Southern..... | 43.00 @ 47.00 |
| Lake Superior..... | 48.00 @ 43.00 |
| Salisbury..... | 50.00 @ 55.00 |

LOUISVILLE.

Messrs. COLEMAN & BRO., 145 West Main street, under date of December 10, write as follows: Notwithstanding the continued low price of foreign Irons, the impression is growing that higher prices will prevail here as soon as the New Year's demand develops itself, and many buyers are entering the market now. We report large sales for the season, especially of Mill Irons, at full market rates below, all cash, at depot here:

| | |
|-----------------------------|-----------------|
| No. 1 Charcoal Foundry..... | \$37.00 @ 38.00 |
| No. 2..... | 35.00 @ 36.00 |
| No. 1 Coke..... | 35.00 @ 36.00 |
| No. 2 "..... | 33.00 @ 35.00 |
| Gray Mill..... | 30.00 @ 31.00 |
| Silver Gray..... | 32.00 @ 34.00 |

Messrs. GEO. H. HULL & Co., under date of December 12, write us as follows: The market shows a better feeling and prices are stiffening. We quote, for cash, as follows:

| FOUNDRY IRONS. | |
|---|-----------------|
| No. 1 Hanging Rock, Charcoal..... | \$38.00 @ 40.00 |
| No. 2..... | 35.00 @ 37.00 |
| No. 1 Southern, Charcoal..... | 35.00 @ 37.00 |
| No. 2..... | 34.00 @ 35.00 |
| Coke. | |
| No. 1 Hanging Rock, Stonecoal and Coke..... | 35.00 @ 37.00 |
| No. 2 Hanging Rock, Stonecoal and Coke..... | 35.00 @ 36.00 |
| No. 1 Southern, Stonecoal and Coke..... | 35.00 @ 37.00 |
| No. 2..... | 35.00 @ 36.00 |
| "American Scotch"..... | 34.00 @ 35.00 |
| Silver Gray..... | 30.00 @ 31.00 |

MILL IRONS.

| | |
|---|---------------|
| No. 1 Charcoal, Cold-short and Neutral..... | 38.00 @ 33.00 |
| No. 1 Stonecoal and Coke, Cold-short and Neutral..... | 31.00 @ 32.00 |
| No. 2 Stonecoal and Coke, Cold-short and Neutral..... | 30.00 @ 31.00 |
| No. 1 Missouri and Indiana, Red-short..... | 38.00 @ 33.00 |
| White and Mottled, Cold-short and Neutral..... | 25.00 @ 26.00 |

CAR WHEEL AND MALLEABLE IRONS.

| | |
|--------------------------------------|---------------|
| Hanging Rock, Cold-blast..... | 45.00 @ 50.00 |
| Alabama and Georgia, Cold-blast..... | 40.00 @ 43.00 |
| Kentucky, Cold-blast..... | 40.00 @ 45.00 |

W. B. BELKNAP & Co., Iron and Steel merchants, Nos. 113 and 115 West Main street, under date of December 15, write as follows: Despite the nearness of the Christmas holiday season, the volume of trade keeps up above the average. Country orders are satisfactory, both as to size and number. During the past week the city has been enlivened by the presence of thousands of strangers, who availed themselves of the reduced passenger rates in vogue during the Great festivities. Country buyers were numerous, which no doubt accounts in a degree for such unusual activity at this season of the year. Prices have been well maintained, and the cutting, which it was feared would begin in December, has not as yet taken place. It is safe to predict that December will go out without witnessing the slightest reduction from card rates. Nails are in good request at \$3.75 for rod. Bar Iron finds ready sale at from \$3.30 @ \$3.40 rate to wholesale buyers. The advance in Carriage Bolts and Hinges has been established, and we can learn of no one who is disposed to sell at anything approximating old prices. The heavy rains at and above Pittsburgh, and the same state of weather here, encourages us to hope for low-priced coal during the rest of the winter. The morning papers report that 5,000,000 bushels have started from Pittsburgh for distribution from this point. The outlook for trade after the 1st of January is unusually good. The high prices obtained for cotton and sugar in the South will make business good in that section.

BALTIMORE.

W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, Baltimore, report us the following under date of December 15: Notwithstanding the near approach of the New Year, trade for the past week has ruled remarkably active, saleable stock being noticeably scarce. We quote the list firm and unchanged:

| | |
|--|-----------------|
| Ref. Bar Iron, 1 to 6 by ¾ to 1..... | 30 3/4 @ 31 1/4 |
| " 1 to 4 1/2 by 1 1/2 to 2..... | 30 1/2 @ 31 |
| " 1 to 2 by 1 to 2..... | 30 1/2 @ 31 |
| Round..... | 30 1/2 @ 31 |
| and Square..... | 30 1/2 @ 31 |
| Hoop Iron, 1 1/2 wide and upward..... | 30 1/2 @ 31 |
| Band Iron, from 1 1/2 to 4 in. wide..... | 30 1/2 @ 31 |
| Horse-shoe Iron..... | 30 1/2 @ 31 |
| Norway Nail Rods..... | 5 @ 5 1/2 |
| Black Diamond Cast Steel..... | 12 1/2 @ 13 1/2 |
| Machinery Steel..... | 8 @ 8 1/2 |
| Cast Spring Steel..... | 8 @ 8 1/2 |
| Homogeneous Steel Plate..... | 6 1/2 @ 7 1/2 |
| Common Horse Nails..... | 10 @ 14 1/2 |
| R. R. Spikes, 5 1/2 x 10..... | 3 1/2 @ 3 1/2 |
| Perkins' Horse shoes, 7 kg of 100 lbs..... | 4 1/2 @ 5 1/2 |
| Mule shoes..... | 5 1/2 @ |
| Putnam Horse Nails..... | 10 @ 8 1/2 |
| Globe Horse Nails..... | 10 @ 21 1/2 |
| Less list discount to the trade..... | 20 @ 21 1/2 |

R. C. HOFFMAN & Co., Iron and Commission Merchants, report the Pig Iron market as follows under date of December 15: The Iron market continues active, with purchasers anxious to contract for future deliveries further in advance than makers are willing to name prices. The tendency is toward a further advance in price for good brands of Iron. We quote:

| | |
|------------------------------------|-----------------|
| Baltimore Charcoal Wheel Iron..... | \$39.00 @ 41.00 |
| Virginia..... | 40.00 @ 43.00 |
| Anthracite No. 1..... | 29.00 @ 30.00 |
| No. 2..... | 28.00 @ 29.00 |
| No. 3..... | 27.00 @ 28.00 |
| Mottled and White..... | 26.00 @ 27.00 |
| Charcoal, C. B. Blooms..... | 75.00 @ 80.00 |
| Billets..... | 80.00 @ 85.00 |
| Refined Blooms..... | 60.00 @ 65.00 |

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of Dec. 15: Values are so unsettled it is impossible to quote. Prices are very firm and advancing.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., Dec. 1, 1879.

One of the principal events of the hebdomadal period which has elapsed since my last letter has been the astonishing outpouring of eloquence by Mr. Gladstone in Scotland. His efforts last week were largely political, but he also touched upon economic subjects of international interest. In my last letter I said that he would never forsake the standard of free trade, and his speech of Thursday last amply vindicates the truth of my assertion. In alluding to

RECIPROCITY.

he designated that theory as a "quack remedy" under the special protection of quack doctors. I am sorry to say there appear to be some in very high station indeed, and, if I am rightly informed, no less a person than her Majesty's Secretary of State for Foreign Affairs, who has been going about the country and indicating a very considerable expectation that possibly, by reciprocity, agricultural distress will be relieved. Let me tell you what is the efficacy of this quack remedy for your agricultural pressure—I will not call it distress, but for the pressure that is upon you, and for the struggle in which you are engaged. Pray watch its operation. You know what is said by the advocates of reciprocity; they always say, "We are the soundest and the best free traders; we recommend reciprocity because it is the truly effectual method of bringing about free trade. At present America imposes enormous duties upon our cotton goods and upon our iron goods. Put reciprocity into play, and then if the reciprocity doctors are right America will become a free-trade country. Very well, gentlemen; how will that operate upon your agriculturalists in particular? It will operate thus: If your condition is to be regretted in certain particulars, and capable of amendment, I ask you to cast the eye of imagination upon the condition of the American agriculturist. It has been very well and truly said, though it is smart and an antithesis, that the American agriculturist has to buy everything he wants at the prices which are fixed in Washington by the Legislature of America; but he has to sell everything that he produces at the prices which are fixed in Liverpool by the free competition of the world. Now would you like that—to have protective prices to pay for everything that you used—for your manure, for your animals, for your implements, for all your farming stock—and at the same time to have to sell what you produced in the free and open market of the world? Bring reciprocity into play, and then, if the reciprocity doctors are right, the Americans will knock off all these protective duties, and the American farmer, instead of producing, as he does now under a disadvantage—a heavy disadvantage—by having to pay protective prices for everything that constitutes his farming stock, will have all his tools, implements, manures, and everything else purchased in the free and open market of the world at free trade prices, and he will be able to produce his corn and compete with you a great deal cheaper than he does now." These are hard hits at reciprocity, but Mr. Gladstone was still more emphatic on the subject of

PROTECTION.

as to which he said, *inter alia*: "It has been asked for by certain injudicious cliques and classes of persons, and by persons connected with the manufacturing industries. They want to have duties laid on manufactures; but here Lord Beaconsfield said, and I cordially concur with him, that he would be no party to the institution of a system in which protection was to be given to manufacturers and was to be refused to agriculture. That one-sided protection I deem to be totally intolerable, and I reject it even at the threshold as unworthy of a word of examination or discussion. But let us come to two-sided protection, and see if that is any better, that is to say, protection in the shape of duties on manufactures and duties on corn, meat, butter, cheese, eggs and everything that can be produced from the land. In order to see whether we can here find a remedy for our difficulties, I prefer to mere abstract arguments the method of reverting to experience. Experience will give us very distinct lessons upon this matter. We have the power, gentlemen, of going back to the times when protection was in full and unchecked force, and of examining the effect which it produced upon the wealth of the country. How, you will ask, do I mean to test the question? I mean to test it by the exports of the country, and I will tell you why, because your prosperity depends upon the wealth of your customers, that is to say, upon their capacity to buy what you produce. And who are your customers? Why, the industrial population of the country, who produce what we export and send all over the world; consequently, when exports increase your customers are doing a large business, are growing wealthy and putting money into their pockets, and are able to take that money out of their pockets in order to fill their stomachs with what you produce. When, on the contrary, exports do not increase, your customers are poor, your friends go down, as you have felt within the last few years, and your condition has been proportionately depressed. * * * In order to see what we owe to our friend protection, I will not allow that friend to take credit for what was done by railways improving the wealth of the country. I go to the time when there were no railways, that is the time before 1830. Here are the official facts, which I will lay before you in the simplest form, and remember, using round numbers. I do that because although round numbers cannot be absolutely accurate, they are easy for the memory to take in, and involve no material error or fabrication of the facts. In 1830 the export of British produce was £39,500,000. I will not say anything about

the population, because there are no accurate returns for the three countries. For 28 years, before 1850, the average of our exports, which in the five years before 1830 was £39,500,000, was only £37,000,000; and while the average of our exports for the five years I have mentioned was £39,500,000, the value in 1830 was £37,000,000. The currency, certainly, was of less value, and I am quite willing to admit that the £37,000,000 was not as much then as it is now. But these facts substantially show that the trade of the country was stationary under protection; the condition of the people was, if possible, getting worse rather than better, the wealth of the country was nearly stationary. I have shown you that protection made no addition and gave no onward movement to the profits of those who are your customers, on whose profits you depend, because, under all circumstances a considerable portion of what Englishmen and Scotchmen produce will some way or other find its way down their throats. That has been the case since we cast off the superstition of protection—since we discarded the imposture of protection. These statements give abundant proof of the fact that neither of the leaders of our political parties will at present give any sort of countenance to protection, whether avowed as such or thinly veiled in the guise of reciprocity. I have touched upon the subject at some length because I apprehend it to possess a good deal of interest for many of your readers. Before I quit the theme I may say that the

AGRICULTURAL ENGINEERS.

who have an association, which includes all the principal implement and agricultural machinery manufacturers of Great Britain, have just had under discussion the policy or otherwise of taking part in the Melbourne Exhibition next year, Victoria being a protectionist colony, as you know. Mr. James Howard, of Bedford, presided over the meeting. You will remember that the members of this association did actually abstain from exhibiting at Philadelphia for the same reason, viz., exorbitant import duties. In this instance, however, it was decided that it was scarcely politic or advisable to take that rather extreme course, instead of which it was resolved to make known in Australia the views of the association, as a protest, but at the same time to open up communications with the Melbourne Exhibition Commissioners without delay. Compared with your tariff the Victorian duties are slight, and the authorities there have abandoned the proposed imposts on reapers and binders, as you will no doubt have had telegraphic intelligence. Taking the matter all round I think the Exhibition at Melbourne next year will be well attended by British exhibitors, who will then and there make a most determined effort to recover their old-time supremacy on Australian and New Zealand ground.

THE IRON TRADE.

of this country is holding its ground fairly well, all things considered. In Scotland the probability of renewed wages disturbances has had the effect of sending up prices a few shillings per ton, the speculators being of opinion that in such circumstances as are foreshadowed by the continued agitation of the men, the production would be much restricted. Hence their eagerness to dabble, with the result indicated. Up to the present, however, there is not only no decrease, but an absolute increase of the output of pig iron all over the country. This enlarged production has been so far attended by an augmented home demand that prices are everywhere firm, and there are no signs of any early "backwardation." The close of the Baltic &c., shipping season and the smaller requirements of your market, might have been expected to bring about a temporary suspension of activity, but that has not been the case, the notable briskness of the ship-building branches and the general revival of confidence at home having fully counterpoised the lessened wants of the outer markets. It is thus seen that we have, hitherto, maintained the advanced positions gained during the past two or three months, and all present indications serve to show that in the majority of instances the furnaces, mills and forges have a satisfactory winter's work before them. The changed state of affairs is no longer confined to the iron trade, but has extended itself to other leading British industries—chemicals, cotton, and textiles, to wit. I heard the other day from an M. P. who has a large factory in Scotland, that whereas three months ago his firm was almost begging for orders, it is now refusing them, even at much higher rates. Such an alteration is of excellent augury, for it indubitably presages a marked revival of the great home market, which is, after all, our chief reliance. The farmers, too, have an excellent seed time, dry and free from the excessive autumnal rains with which we are generally inundated, so that they are disposed to be much more hopeful than they were a few months ago. Their confidence once restored they will go along cheerfully, and although that cannot be said to be yet the case, we shall get a capital rally wherewith to begin the New Year. Our foreign advisers lead us to the same conclusion, and show us that France and Belgium are fast becoming so well engaged that they won't have the leisure or the means to compete with us on any sort of formidable scale. All things considered, therefore, our prospects are hopelessly good, and although we are not, perhaps, wholly "out of the wood," we are strongly inclined to "holloa" and cry "tantivy." So far as the Bessemer departments are in question, the point admits of scarcely any shadow of a doubt, for all the leading mills are quite busy, and have so many inquiries that their ample employment is assured for at least the next three months. Their business is not only for railways, but largely for the tramways which are being laid down in different parts of the country. Official documents issued on Friday show a surprising number of projects of this kind for the sanction of Parliament next session—a fact which is not only of importance to our rail makers, but, I take it, for your car builders. Every town of any size is likely to possess these valuable adjuncts shortly, and the capital proposed to be expended is, in the aggregate, very large. During the past week Brown, Bayley & Dixon, of Sheffield,

field, have secured an order for about seven miles of these rails for the town of Oldham.

SCOTCH PIG IRON
has ruled strong during the week, for reasons already stated, and is not unlikely to go somewhat higher still, although shipments have receded to a very marked extent, as compared with those a few weeks ago. There are now, according to John E. Swan & Bros., 389,617 tons in Connal's stores at Glasgow, against 199,283 this date last year, while the number of operative furnaces in Scotland is 99, against 92 a year ago. The total shipments this year to date have increased 153,287 tons, about three-fourths foreign and the balance coastwise. Ballast pig iron is still held at 45/3 ton, delivered alongside ship in the Forth or Clyde. Imports from Middlesboro into Grangemouth are again increasing, although the aggregate to date shows a falling off of 30,014 tons for this year.

Included in last week's exports were pigs worth £4305 for New York, and £1065 for Baltimore. The shipments of manufactured iron and machinery were worth £30,000, including £3240 old rails for New York and £1012 Baltimore.

CLEVELAND PIG IRON
is now quoted as under for G. M. B.:

| | |
|------------------------|----------------------|
| No. 1 Foundry..... 48/ | No. 4 Forge..... 44/ |
| 2 " "..... 45/ | 5 " "..... 43/ |
| 3 " "..... 44/ | 6 " "..... 42/ |
| 4 " "..... 43/ | 7 " "..... 41/ |

All net cash, delivered f. o. b. at makers' wharves in the Tees wharves.

Ship plates are in great request in the North of England, nearly 70,000 tons of plates and angles being estimated to be needed for the vessels already ordered on the Clyde and the northern rivers.

FROM SHEFFIELD
such news as is to hand is fairly hopeful and cheerful. Many of the lighter trades are now enjoying comparative prosperity, and some are even doing more business than is usual at this period of the year. This, I understand, is the case with the electroplaters and the skate manufacturers. The latter did a "roaring" turnover last year, and they are disposed to think that they have now got another splendid "boom" on hand. The crucible steel houses are doing more work, a considerable proportion of their additional output being destined for your market, whence a number of capital orders have recently been received at Steelopolis. The heavy iron works are fairly busy all round, alike on railway materials, ship plates, beams and angles, and general merchant qualities. The armor plate mills are moderately busy, John Brown & Co. having a good order from the Argentine Republic. The rail mills are full of orders and the Bessemer works well employed in all directions. By the

DEATH OF MR. ROEBUCK,
which occurred here, suddenly, early yesterday morning, Sheffield will at once have a keenly contested election forced upon it. Mr. Roebuck had for a long series of years occupied a singularly prominent and independent position as the senior parliamentary representative of Sheffield. He was never allied to any party, and prided himself upon being a terror alike to friend and foe, a man whose vote could not be absolutely depended upon by either of the whips. As "Tear'em" Mr. Roebuck was known for many years, and was held in high esteem. His grandfather, I may say, was the Dr. Roebuck who founded the Carron Iron Works, Scotland, where he accumulated a large fortune, which he afterwards lost in shale-oil mining in the same country. The Liberal candidate for Sheffield will be Mr. Waddy, Q. C., now M. P. for Barnstaple. The Conservatives will probably bring forward either Mr. Mark Firth (of Thomas Firth & Sons), Mr. H. E. Watson, a local solicitor, or Mr. Stuart Wortley, a nephew of the Earl of Wharfedale, whose large estates are very near the town. If Mr. Firth can be persuaded to stand, I should be inclined to think his election almost, or quite certain.

THE MIDDLEMAN
in trade in this country will sooner or later be a doomed figure, and will have to retire into obscurity. The tendency of all modern business is to establish direct relations between the manufacturer or producer and the actual consumer. In some branches of commerce this is being slowly but surely effected by means of agencies, especially in London, where matters are on such an enormous scale that there is ample scope, and room to spare, for the most energetic of men to devote all their energies to the sale of any given article. In the smaller towns and the provinces the middleman may, and probably will, long survive as a man who stocks and vends the wares of many producers, none of whom would find it pay them to retain the services of a special agent for the limited business which he might at the very best be enabled to command. In London the Scotch stove-grate houses and general founders, who have made Thames street their selected center, have for some time been supplying the builders and others on terms which in all probability differ very little from those which are accorded to the ironmongers. Other houses in the metropolis make it a rule to regulate their terms by quantities alone, without any special regard whether or not their customer is in "the trade." Thus if a buyer requires one article the price is so much; if two or more a corresponding reduction is given on each; so that the large buyer is alone the wholesale buyer and he only gets best terms. For this latter mode of conducting business there is probably much to be said. One of the latest, and from a public point of view, best, developments of this policy is found in a meeting of Northern coal owners in London (at Morley's Hotel, a place long sacred to Americans) on Saturday to consider the position of the trade with respect to consumers in the great metropolis. It was stated that the present average cost of coal in the Pool (a part of the Thames just below London Bridge) did not exceed 16/ per ton, whereas the retail prices ranged from 22/ to 27/ per ton. The coal merchants of London have a ring which fixes selling prices, and these now leave profits of 6/ to 10/ per ton. The coal owners did not object to a profit of 5/ per ton, but they alleged that such a state of things robbed the consumers and left them (the

colliery proprietors) no profit whatever. It was stated that one firm of London coal merchants alone made a yearly profit of not less than £50,000. Further measures will be taken to disturb this enormous and anomalous state of affairs. The supply of 4,500,000 persons is certainly a prize worthy of being ardently contended for.

STAFFORDSHIRE AND BIRMINGHAM
are without special change to note, although it must be recorded that their principal industries are fairly well engaged all round. In the iron trade this process of reinvigoration which has been set on foot of late is progressing apace, and there is a general refurbishing up of old plant and a restarting of long-idle furnaces. The galvanizers have again advanced quotations 20/ a ton, and several of the finished iron makers have declared medium and common bars, sheets, plates and hoops up another 10/ per ton. At Warrington (which is in Lancashire, by-the-by) iron wire is up 20/ and steel wire 30/. Cut nails, tacks, and many other minor hardwares are advanced by 5 to 10 per cent. less discount, with every prospect of the new rates being steadily maintained. People are now showing less fear as to the stability of the revival, and most of the hesitation is shown by purchasers.

PAT. "SCREW WINDOW BALANCES."

Retail Price, \$1 per window (four balances).
Liberal Discount to the Trade.
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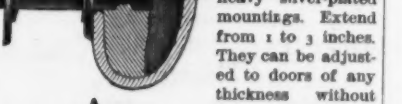
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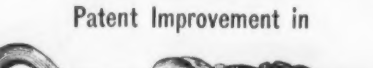
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No. 1. Rope Halters, Horse Ties, Cattle Ties, Halter Leads, &c., made by clamping the lap with steel rings, as shown in cut. Also, clamping the end with a ring to prevent unbraking.

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field, have secured an order for about seven miles of these rails for the town of Oldham.

SCOTCH PIG IRON

has ruled strong during the week, for reasons already stated, and is not unlikely to go somewhat higher still, although shipments have receded to a very marked extent, as compared with those a few weeks ago. There are now, according to John E. Swan & Bros., 389,617 tons in Connal's stores at Glasgow, against 199,283 this date last year, while the number of operative furnaces in Scotland is 99, against 92 a year ago. The total shipments this year to date have increased 153,287 tons, about three-fourths foreign and the balance coastwise. Ballast pig iron is still held at 45/3 ton, delivered alongside ship in the Forth or Clyde. Imports from Middlesboro' into Grangemouth are again increasing, although the aggregate to date shows a falling off of 30,014 tons for this year.

Included in last week's exports were pigs worth £4305 for New York, and £1068 for Baltimore. The shipments of manufactured iron and machinery were worth £30,000, including £3240 old rails for New York and £1012 Baltimore.

CLEVELAND PIG IRON

is now quoted as under for G. M. B.:

| | |
|------------------------|----------------------|
| No. 1 Foundry..... 48/ | No. 4 Forge..... 44/ |
| 3 " "..... 45/ | Mottled..... 43/6 |
| 4 " "..... 43/ | White..... 42/ |
| 5 " "..... 43/6 | Kentledge..... 47/6 |

All net cash, delivered f. o. b. at makers' wharves in the Tees wharves.

Ship plates are in great request in the North of England, nearly 70,000 tons of plates and angles being estimated to be needed for the vessels already ordered on the Clyde and the northern rivers.

FROM SHEFFIELD

such news as is to hand is fairly hopeful and cheerful. Many of the lighter trades are now enjoying comparative prosperity, and some are even doing more business than usual at this period of the year. This, I understand, is the case with the electroplaters and the skate manufacturers. The latter did a "roaring" turnover last year, and they are disposed to think that they have now got another splendid "boom" on hand. The crucible steel houses are doing more work, a considerable proportion of their additional output being destined for your market, whence a number of capital orders have recently been received at Steelopolis. The heavy iron works are fairly busy all round, alike on railway materials, ship plates, beams and angles, and general merchant qualities. The armor plate mills are moderately busy, John Brown & Co. having a good order from the Argentine Republic. The rail mills are full of orders and the Bessemer works well employed in all directions. By the

DEATH OF MR. ROEBUCK

which occurred here, suddenly, early yesterday morning, Sheffield will at once have a keenly contested election forced upon it. Mr. Roebuck had for a long series of years occupied a singularly prominent and independent position as the senior parliamentary representative of Sheffield. He was never allied to any party, and prided himself upon being a terror alike to friend and foe, a man whose vote could not be absolutely depended upon by either of the whips. As "Tear'em" Mr. Roebuck was known for many years, and was held in high esteem. His grandfather, I may say, was the Dr. Roebuck who founded the Carron Iron Works, Scotland, where he accumulated a large fortune, which he afterwards lost in shale-oil mining in the same country. The Liberal candidate for Sheffield will be Mr. Waddy, Q. C., now M. P. for Barnstaple. The Conservatives will probably bring forward either Mr. Mark Firth (of Thomas Firth & Sons), Mr. H. E. Watson, a local solicitor, or Mr. Stuart Wortley, a nephew of the Earl of Wharfedale, whose large estates are very near the town. If Mr. Firth can be persuaded to stand, I should be inclined to think his election almost, or quite certain.

THE MIDDLEMAN

in trade in this country will sooner or later be a doomed figure, and will have to retire into obscurity. The tendency of all modern business is to establish direct relations between the manufacturer or producer and the actual consumer. In some branches of commerce this is being slowly but surely effected by means of agencies, especially in London, where matters are on such an enormous scale that there is ample scope, and room to spare, for the most energetic of men to devote all their energies to the sale of any given article. In the smaller towns and the provinces the middleman may, and probably will, long survive as a man who stocks and vends the wares of many producers, none of whom would find it pay them to retain the services of a special agent for the limited business which he might at the very best be enabled to command. In London the Scotch stove-grate houses and general founders, who have made Thames street their selected center, have for some time been supplying the builders and others on terms which in all probability differ very little from those which are accorded to the ironmongers. Other houses in the metropolis make it a rule to regulate their terms by quantities alone, without any special regard whether or not their customer is in "the trade." Thus if a buyer requires one article the price is so much; if two or more a corresponding reduction is given on each; so that the large buyer is alone the wholesale buyer and he only gets best terms. For this latter mode of conducting business there is probably much to be said. One of the latest, and, from a public point of view, best, developments of this policy is found in a meeting of Northern coal owners in London (at Morley's Hotel, a place long sacred to Americans) on Saturday to consider the position of the trade with respect to consumers in the great metropolis. It was stated that the present average cost of coal in the Pool (a part of the Thames just below London Bridge) did not exceed 16/ per ton, whereas the retail prices ranged from 22/ to 27/ per ton. The coal merchants of London have a ring which fixes selling prices, and these now leave profits of 6/ to 10/ per ton. The coal owners did not object to a profit of 5/ per ton, but they alleged that such a state of things robbed the consumers and left them (the

colliery proprietors) no profit whatever. It was stated that one firm of London coal merchants alone made a yearly profit of not less than £50,000. Further measures will be taken to disturb this enormous and anomalous state of affairs. The supply of 4,500,000 persons is certainly a prize worthy of being ardently contended for.

STAFFORDSHIRE AND BIRMINGHAM

are without especial change to note, although it must be recorded that their principal industries are fairly well engaged all round. In the iron trade the process of revivification which has been set on foot of late is progressing apace, and there is a general furnishing up of old plant and a restarting of long-idle furnaces. The galvanizers have again advanced quotations 20/ a ton, and several of the finished iron makers have declared medium and common bars, sheets, plates and hoops up another 10/ per ton. At Warrington (which is in Lancashire, by-the-by) the iron wire is up 20/ and steel wire 30/. Cut nails, tacks, and many other minor hardwares are advanced by 5 to 10 per cent. less discount, with every prospect of the new rates being steadily maintained. People are now showing less fear as to the stability of the revival, and most of the hesitation is shown by purchasers.

PAT. "SCREW WINDOW BALANCES."

Retail Price, \$1 per window (four balances). Liberal Discount to the Trade. Retain Medium and Light Window Sash at any point of opening, with large surplus holding power in reserve, available if required by drawing the adjusting screws. An acquaintance with the genuine merits of these goods, and their simple requirements in use will insure to them the favor of the user and applier.

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No more Splicing or Winding Ends with Cord.

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Rope Halters, Horse Ties, Cattle Ties, Halter Leads, &c., made by clamping the lap with steel rings, as shown in cut. Also, clamping the end with a ring to prevent unbraiding.

This is all accomplished by machinery, and a superior article can be made at so much less cost, it will not pay any one to make up goods the old way. We are now prepared to furnish the trade the cheapest and best Rope Halters ever made. No. 1 illustrates the twisted and irregular form of the spliced Halter; also the insecure method of whipping the end with cord, which invariably comes off, and allows the rope to untwist. No. 2 illustrates the New Halter. It is made by clamping the laps with steel rings. The end is also secured with a steel ring, which will remain as long as the rope lasts. We have also a full line of

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METALS.

IRON.—Duty: Bars, 1 to 14c. Sheet, Band and Hoop and Shell, 15 to 18c. If provided, that none of the above shall pay a less rate of duty than 35 per cent. Fig. 77 ton; Polished Sheet, 35c. Fig. 78 ton; Wrought Scrap, 25c. Fig. 79 ton; Cast Scrap, 20c. Fig. 80 ton; Railroad 70c. Fig. 81 ton; Boiler and Plate, 15c. Fig. 82 ton.

Pig Iron.—American Nominal. Foundry No. 1, 25c. Fig. 83 ton; No. 2, 24c. Fig. 84 ton; Gray Forge, 23c. Fig. 85 ton.

SCOTCH.—Eglington, 25c. Fig. 86 ton; Coltness, 24c. Fig. 87 ton; Glasgow, 23c. Fig. 88 ton; Gartsherrie, 22c. Fig. 89 ton.

RAILS.—Iron, 25c. Fig. 90 ton; Steel, 24c. Fig. 91 ton; Old Rails, 23c. Fig. 92 ton.

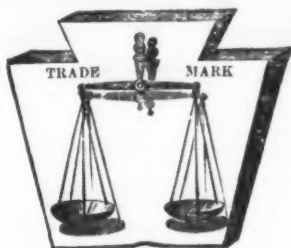
BRASS.—Wrought Scrap, from yard, 25c. Fig. 93 ton.

STEEL.—Common Iron: 4 to 2 in. round and square, 25c. Fig. 94 ton; 1 to 6 in. 3/4 to 1 in., 24c. Fig. 95 ton; Refined Iron: 4 to 2 in. round and square, 25c. Fig. 96 ton; 1 to 6 in. 3/4 to 1 in., 24c. Fig. 97 ton; 1 to 6 in. 3/4 and 5/8, 23c. Fig. 98 ton; Rods—4 and 1/2 round and square, 25c. Fig. 99 ton; Bands—1 to 6 in. 3/4 to No. 12, 24c. Fig. 100 ton; Norway Nail Rods, 23c. Fig. 101 ton.

SHEET IRON.—Common American, 25c. Fig. 102 ton; No. 10 to 20, 24c. Fig. 103 ton; 21 to 24, 23c. Fig. 104 ton; 25 to 28, 22c. Fig. 105 ton; 29 to 32, 21c. Fig. 106 ton; 33 to 36, 20c. Fig. 107 ton; 37 to 40, 19c. Fig. 108 ton; 41 to 44, 18c. Fig. 109 ton; 45 to 48, 17c. Fig. 110 ton; 49 to 52, 16c. Fig. 111 ton; 53 to 56, 15c. Fig. 112 ton; 57 to 60, 14c. Fig. 113 ton; 61 to 64, 13c. Fig. 114 ton; 65 to 68, 12c. Fig. 115 ton; 69 to 72, 11c. Fig. 116 ton; 73 to 76, 10c. Fig. 117 ton; 77 to 80, 9c. Fig. 118 ton; 81 to 84, 8c. Fig. 119 ton; 85 to 88, 7c. Fig. 120 ton; 89 to 92, 6c. Fig. 121 ton; 93 to 96, 5c. Fig. 122 ton; 97 to 100, 4c. Fig. 123 ton; 101 to 104, 3c. Fig. 124 ton; 105 to 108, 2c. Fig. 125 ton; 109 to 112, 1c. Fig. 126 ton; 113 to 116, 1/2c. Fig. 127 ton; 117 to 120, 1/4c. Fig. 128 ton; 121 to 124, 1/8c. Fig. 129 ton; 125 to 128, 1/16c. Fig. 130 ton; 129 to 132, 1/32c. Fig. 131 ton; 133 to 136, 1/64c. Fig. 132 ton; 137 to 140, 1/128c. Fig. 133 ton; 141 to 144, 1/256c. Fig. 134 ton; 145 to 148, 1/512c. Fig. 135 ton; 149 to 152, 1/1024c. Fig. 136 ton; 153 to 156, 1/2048c. Fig. 137 ton; 157 to 160, 1/4096c. Fig. 138 ton; 161 to 164, 1/8192c. Fig. 139 ton; 165 to 168, 1/16384c. Fig. 140 ton; 169 to 172, 1/32768c. Fig. 141 ton; 173 to 176, 1/65536c. Fig. 142 ton; 177 to 180, 1/131072c. Fig. 143 ton; 181 to 184, 1/262144c. Fig. 144 ton; 185 to 188, 1/524288c. Fig. 145 ton; 189 to 192, 1/1048576c. Fig. 146 ton; 193 to 196, 1/2097152c. Fig. 147 ton; 197 to 200, 1/4194304c. Fig. 148 ton; 201 to 204, 1/8388608c. Fig. 149 ton; 205 to 208, 1/16777216c. Fig. 150 ton; 209 to 212, 1/33554432c. Fig. 151 ton; 213 to 216, 1/67108864c. Fig. 152 ton; 217 to 220, 1/134217728c. Fig. 153 ton; 221 to 224, 1/268435456c. Fig. 154 ton; 225 to 228, 1/536870912c. Fig. 155 ton; 229 to 232, 1/1073741824c. Fig. 156 ton; 233 to 236, 1/2147483648c. Fig. 157 ton; 237 to 240, 1/4294967296c. Fig. 158 ton; 241 to 244, 1/8589934592c. Fig. 159 ton; 245 to 248, 1/17179869184c. Fig. 160 ton; 249 to 252, 1/34359738368c. Fig. 161 ton; 253 to 256, 1/68719476736c. Fig. 162 ton; 257 to 260, 1/137438953472c. Fig. 163 ton; 261 to 264, 1/274877906944c. Fig. 164 ton; 265 to 268, 1/549755813888c. Fig. 165 ton; 269 to 272, 1/1099511627776c. Fig. 166 ton; 273 to 276, 1/2199023255552c. Fig. 167 ton; 277 to 280, 1/4398046511104c. Fig. 168 ton; 281 to 284, 1/8796093022208c. Fig. 169 ton; 285 to 288, 1/17592186044416c. Fig. 170 ton; 289 to 292, 1/35184372088832c. Fig. 171 ton; 293 to 296, 1/70368744177664c. Fig. 172 ton; 297 to 300, 1/140737488355328c. Fig. 173 ton; 301 to 304, 1/281474976710656c. Fig. 174 ton; 305 to 308, 1/562949953421312c. Fig. 175 ton; 309 to 312, 1/1125899906842624c. Fig. 176 ton; 313 to 316, 1/2251799813685248c. Fig. 177 ton; 317 to 320, 1/4503599627370496c. Fig. 178 ton; 321 to 324, 1/9007199254740992c. Fig. 179 ton; 325 to 328, 1/18014398509481984c. Fig. 180 ton; 329 to 332, 1/36028797018963968c. Fig. 181 ton; 333 to 336, 1/72057594037927936c. Fig. 182 ton; 337 to 340, 1/144115188075855872c. Fig. 183 ton; 341 to 344, 1/288230376151711744c. Fig. 184 ton; 345 to 348, 1/576460752303423488c. Fig. 185 ton; 349 to 352, 1/1152921504606846976c. Fig. 186 ton; 353 to 356, 1/2305843009213693952c. Fig. 187 ton; 357 to 360, 1/4611686018427387904c. Fig. 188 ton; 361 to 364, 1/9223372036854775808c. Fig. 189 ton; 365 to 368, 1/18446744073709551616c. Fig. 190 ton; 369 to 372, 1/36893488147419103232c. Fig. 191 ton; 373 to 376, 1/73786976294838206464c. Fig. 192 ton; 377 to 380, 1/147573952589676412928c. Fig. 193 ton; 381 to 384, 1/295147905179352825856c. Fig. 194 ton; 385 to 388, 1/590295810358705651712c. Fig. 195 ton; 389 to 392, 1/1180591620717411303424c. Fig. 196 ton; 393 to 396, 1/2361183241434822606848c. Fig. 197 ton; 397 to 400, 1/4722366482869645213696c. Fig. 198 ton; 401 to 404, 1/9444732965739290427392c. Fig. 199 ton; 405 to 408, 1/18889465931478580854784c. Fig. 200 ton; 409 to 412, 1/37778931862957161709568c. Fig. 201 ton; 413 to 416, 1/75557863725914323419136c. Fig. 202 ton; 417 to 420, 1/151115727451828646838272c. Fig. 203 ton; 421 to 424, 1/302231454903657293676544c. Fig. 204 ton; 425 to 428, 1/604462909807314587353088c. Fig. 205 ton; 429 to 432, 1/1208925819614629174706176c. Fig. 206 ton; 433 to 436, 1/2417851639229258349412352c. Fig. 207 ton; 437 to 440, 1/4835703278458516698824704c. Fig. 208 ton; 441 to 444, 1/9671406556917033397649408c. Fig. 209 ton; 445 to 448, 1/19342813113834066795298816c. Fig. 210 ton; 449 to 452, 1/38685626227668133590597632c. Fig. 211 ton; 453 to 456, 1/77371252455336267181195264c. Fig. 212 ton; 457 to 460, 1/154742504910672534362390528c. Fig. 213 ton; 461 to 464, 1/309485009821345068724781056c. Fig. 214 ton; 465 to 468, 1/618970019642690137449562112c. Fig. 215 ton; 469 to 472, 1/1237940039285380274899124224c. Fig. 216 ton; 473 to 476, 1/2475880078570760549798248448c. Fig. 217 ton; 477 to 480, 1/4951760157141521099596496896c. Fig. 218 ton; 481 to 484, 1/9903520314283042199192993792c. Fig. 219 ton; 485 to 488, 1/19807040628566084398385987584c. Fig. 220 ton; 489 to 492, 1/39614081257132168796771975168c. Fig. 221 ton; 493 to 496, 1/79228162514264337593543950336c. Fig. 222 ton; 497 to 500, 1/158456325028528675187087900672c. Fig. 223 ton; 501 to 504, 1/316912650057057350374175801344c. Fig. 224 ton; 505 to 508, 1/633825300114114700748351602688c. Fig. 225 ton; 509 to 512, 1/1267650600228229401496703205376c. Fig. 226 ton; 513 to 516, 1/2535301200456458802993406410752c. Fig. 227 ton; 517 to 520, 1/5070602400912917605986812821504c. Fig. 228 ton; 521 to 524, 1/10141204801825835211973625643008c. Fig. 229 ton; 525 to 528, 1/20282409603651670423947251286016c. Fig. 230 ton; 529 to 532, 1/40564819207303340847894502572032c. Fig. 231 ton; 533 to 536, 1/81129638414606681695789005144064c. Fig. 232 ton; 537 to 540, 1/162259276829213363391578010288128c. Fig. 233 ton; 541 to 544, 1/324518553658426726783156020576256c. Fig. 234 ton; 545 to 548, 1/649037107316853453566312041152512c. Fig. 235 ton; 549 to 552, 1/1298074214633706907132624082305024c. Fig. 236 ton; 553 to 556, 1/2596148429267413814265248164610048c. Fig. 237 ton; 557 to 560, 1/5192296858534827628530496329220096c. Fig. 238 ton; 561 to 564, 1/10384593717069655257060992658440192c. Fig. 239 ton; 565 to 568, 1/20769187434139310514121985316880384c. Fig. 240 ton; 569 to 572, 1/41538374868278621028243970633760768c. Fig. 241 ton; 573 to 576, 1/83076749736557242056487941267521536c. Fig. 242 ton; 577 to 580, 1/166153499473114484112975882535043072c. Fig. 243 ton; 581 to 584, 1/332306998946228968225951765070086144c. Fig. 244 ton; 585 to 588, 1/664613997892457936451903530140172288c. Fig. 245 ton; 589 to 592, 1/1329227995784915872903807060280344576c. Fig. 246 ton; 593 to 596, 1/2658455991569831745807614120560689152c. Fig. 247 ton; 597 to 600, 1/5316911983139663491615228241121378304c. Fig. 248 ton; 601 to 604, 1/10633823966279326983230456482242756608c. Fig. 249 ton; 605 to 608, 1/21267647932558653966460912964485513216c. Fig. 250 ton; 609 to 612, 1/42535295865117307932921825928971026432c. Fig. 251 ton; 613 to 616, 1/85070591730234615865843651857942052864c. Fig. 252 ton; 617 to 620, 1/170141183460469231731687303715884105728c. Fig. 253 ton; 621 to 624, 1/340282366920938463463374607431768211456c. Fig. 254 ton; 625 to 628, 1/680564733841876926926749214863536422912c. Fig. 255 ton; 629 to 632, 1/1361129467683753853853498429727072845824c. Fig. 256 ton; 633 to 636, 1/2722258935367507707706996859454145691648c. Fig. 257 ton; 637 to 640, 1/5444517870735015415413993718908291383296c. Fig. 258 ton; 641 to 644, 1/10889035741470030830827987437816582766592c. Fig. 259 ton; 645 to 648, 1/21778071482940061661655974875633165533184c. Fig. 260 ton; 649 to 652, 1/43556142965880123323311949751266331066368c. Fig. 261 ton; 653 to 656, 1/87112285931760246646623899502532662132736c. Fig. 262 ton; 657 to 660, 1/174224571863520493293247799005065324265472c. Fig. 263 ton; 661 to 664, 1/348449143727040986586495598010130648530944c. Fig. 264 ton; 665 to 668, 1/696898287454081973172991196020261297061888c. Fig. 265 ton; 669 to 672, 1/1393796574908163946345982392040522594123776c. Fig. 266 ton; 673 to 676, 1/2787593149816327892691964784081045188247552c. Fig. 267 ton; 677 to 680, 1/5575186299632655785383929568162090376495104c. Fig. 268 ton; 681 to 684, 1/11150372599265311570767859136244180752990208c. Fig. 269 ton; 685 to 688, 1/22300745198530623141535718272488360150580416c. Fig. 270 ton; 689 to 692, 1/4460149039706124628307143654497672030116032c. Fig. 271 ton; 693 to 696, 1/8920298079412249256614287308995344060232064c. Fig. 272 ton; 697 to 700, 1/17840596158824498513228574617990688120464128c. Fig. 273 ton; 701 to 704, 1/35681192317648997026457149235981376240928512c. Fig. 274 ton; 705 to 708, 1/71362384635297994052914298471962752481856024c. Fig. 275 ton; 709 to 712, 1/142724769270595988105828596943925504963712048c. Fig. 276 ton; 713 to 716, 1/285449538541191976211657193887851009927424096c. Fig. 277 ton; 717 to 720, 1/570899077082383952423314387775702019854848192c. Fig. 278 ton; 721 to 724, 1/1141798154164767904846628775551404039709696384c. Fig. 279 ton; 725 to 728, 1/2283596308329535809693257551102808079419392768c. Fig. 280 ton; 729 to 732, 1/4567192616659071619386515102205616158838785536c. Fig. 281 ton; 733 to 736, 1/9134385233318143238773030204411232317677571072c. Fig. 282 ton; 737 to 740, 1/18268770466636286477546060408822464635355142144c. Fig. 283 ton; 741 to 744, 1/36537540933272572955092120817644929270710284288c. Fig. 284 ton; 745 to 748, 1/73075081866545145910184241635289858541420568576c. Fig. 285 ton; 749 to 752, 1/146150163733090291820368483270579717082841137152c. Fig. 286 ton; 753 to 756, 1/292300327466180583640736966541159434165682274304c. Fig. 287 ton; 757 to 760, 1/584600654932361167281473933082318868331364548608c. Fig. 288 ton; 761 to 764, 1/1169201309864722334562947866164637736662729097216c. Fig. 289 ton; 765 to 768, 1/2338402619729444669125895732329275473325458194432c. Fig. 290 ton; 769 to 772, 1/4676805239458889338251791464658550946650916388864c. Fig. 291 ton; 773 to 776, 1/9353610478917778676503582929317101893301832777728c. Fig. 292 ton; 777 to 780, 1/18707220957835557353007165858634203786603665555456c. Fig. 293 ton; 781 to 784, 1/37414441915671114706014331717268407573207331110912c. Fig. 294 ton; 785 to 788, 1/74828883831342229412028663434536815146414662221824c. Fig. 295 ton; 789 to 792, 1/14965776766268445882405732686907363029282932444352c. Fig. 296 ton; 793 to 796, 1/29931553532536891764811465373814726058565864888704c. Fig. 297 ton; 797 to 800, 1/59863107065073783529622930747629452117131729777408c. Fig. 298 ton; 801 to 804, 1/119726214130147567059245861495258904234263459554816c. Fig. 299 ton; 805 to 808, 1/239452428260295134118491722990517808468526919109632c. Fig. 300 ton; 809 to 812, 1/478904856520590268236983445981035616937053838219264c. Fig. 301 ton; 813 to 816, 1/957809713041180536473966891962071233874107676438528c. Fig. 302 ton; 817 to 820, 1/1915619426082361072947933783924142467748215352877056c. Fig. 303 ton; 821 to 824, 1/3831238852164722145895867567848284935496430705754112c. Fig. 304 ton; 825 to 828, 1/7662477704329444291791735135696569870992861411508224c. Fig. 305 ton; 829 to 832, 1/15324955408658888583583470271393139741985722823016448c. Fig. 306 ton; 833 to 836, 1/30649910817317777167166940542786279483971445646032896c. Fig. 307 ton; 837 to 840, 1/61299821634635554334333881085572558967942891292065792c. Fig. 308 ton; 841 to 844, 1/122599643269271108668667762171145117935885782584131584c. Fig. 309 ton; 845 to 848, 1/245199286538542217337335524342290235871771565168263168c. Fig. 310 ton; 849 to 852, 1/490398573077084434674671048684580471743543130336526336c. Fig. 311 ton; 853 to 856, 1/980797146154168869349342097369160943487086260673052672c. Fig. 312 ton; 857 to 860, 1/1961594292288337738698684194738321888974172521346105344c. Fig. 313 ton; 861 to 864, 1/3923188584576675477397368389476643777948345042692210688c. Fig. 314 ton; 865 to 868, 1/7846377169153350954794736778953287555896690085384421376c. Fig. 315 ton; 869 to 872, 1/15692754338306701909589473557906575111793380170768842752c. Fig. 316 ton; 873 to 876, 1/31385508676613403819178947115813150223586760341537685504c. Fig. 317 ton; 877 to 880, 1/62771017353226807638357894231626300447173520683075371008c. Fig. 318 ton; 881 to 884, 1/125542034706453615276715788463252600894347041366150742016c. Fig. 319 ton; 885 to 888, 1/251084069412907230553431577326505201788694082732301484032c. Fig. 320 ton; 889 to 892, 1/502168138825814461106863154653010403577388165464602968064c. Fig. 321 ton; 893 to 896, 1/1004336277651628922213726309306020807154776330929205936128c. Fig. 322 ton; 897 to 900, 1/2008672555303257844427452618612041614289552661858411872256c. Fig. 323 ton; 901 to 904, 1/4017345110606515688854905237224083228579105323716823744512c. Fig. 324 ton; 905 to 908, 1/8034690221213031377709810474448166457158210647433647489024c. Fig. 325 ton; 909 to 912, 1/16069380442426062755419620948896332914216421294867294978048c. Fig. 326 ton; 913 to 916, 1/32138760884852125510839241897792665828432842589734589956096c. Fig. 327 ton; 917 to 920, 1/64277521769704251021678483795585331656865685179469179912192c. Fig. 328 ton; 921 to 924, 1/128555043539408502043356967591170663313731370358938359824384c. Fig. 329 ton; 925 to 928, 1/257110087078817004086713935182341326627462740717876719648768c. Fig. 330 ton; 929 to 932, 1/514220174157634008

HENRY DISSTON & SONS

KEYSTONE SAW, TOOL,



STEEL and FILE WORKS,

FRONT AND LAUREL STS., Philadelphia.

BRANCH WORKS: Tacony, Pa.; Chicago, Ill.

We desire to call attention to the improvement in putting up our goods, substituting boxes for paper covering. This will prove a great advantage to the dealer, saving the time consumed in untying and tying, also keeping them in better condition.

The new style Box here shown is our latest. We have been putting up the No. 76 D-S and No. 120 Saws in boxes containing one-third of a dozen.



We have decided to put up all the saws marked "Disston" in this manner.

The boxes will contain 1/2 dozen, and be assorted as follows: 1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2, 2 1/4, 2 1/2, 3, 3 1/4, 3 1/2, 4, 4 1/4, 4 1/2, 5, 5 1/4, 5 1/2, 6, 6 1/4, 6 1/2, 7, 7 1/4, 7 1/2, 8, 8 1/4, 8 1/2, 9, 9 1/4, 9 1/2, 10, 10 1/4, 10 1/2, 11, 11 1/4, 11 1/2, 12, 12 1/4, 12 1/2, 13, 13 1/4, 13 1/2, 14, 14 1/4, 14 1/2, 15, 15 1/4, 15 1/2, 16, 16 1/4, 16 1/2, 17, 17 1/4, 17 1/2, 18, 18 1/4, 18 1/2, 19, 19 1/4, 19 1/2, 20, 20 1/4, 20 1/2, 21, 21 1/4, 21 1/2, 22, 22 1/4, 22 1/2, 23, 23 1/4, 23 1/2, 24, 24 1/4, 24 1/2, 25, 25 1/4, 25 1/2, 26, 26 1/4, 26 1/2, 27, 27 1/4, 27 1/2, 28, 28 1/4, 28 1/2, 29, 29 1/4, 29 1/2, 30, 30 1/4, 30 1/2, 31, 31 1/4, 31 1/2, 32, 32 1/4, 32 1/2, 33, 33 1/4, 33 1/2, 34, 34 1/4, 34 1/2, 35, 35 1/4, 35 1/2, 36, 36 1/4, 36 1/2, 37, 37 1/4, 37 1/2, 38, 38 1/4, 38 1/2, 39, 39 1/4, 39 1/2, 40, 40 1/4, 40 1/2, 41, 41 1/4, 41 1/2, 42, 42 1/4, 42 1/2, 43, 43 1/4, 43 1/2, 44, 44 1/4, 44 1/2, 45, 45 1/4, 45 1/2, 46, 46 1/4, 46 1/2, 47, 47 1/4, 47 1/2, 48, 48 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1/4, 98 1/2, 99, 99 1/4, 99 1/2, 100, 100 1/4, 100 1/2, 101, 101 1/4, 101 1/2, 102, 102 1/4, 102 1/2, 103, 103 1/4, 103 1/2, 104, 104 1/4, 104 1/2, 105, 105 1/4, 105 1/2, 106, 106 1/4, 106 1/2, 107, 107 1/4, 107 1/2, 108, 108 1/4, 108 1/2, 109, 109 1/4, 109 1/2, 110, 110 1/4, 110 1/2, 111, 111 1/4, 111 1/2, 112, 112 1/4, 112 1/2, 113, 113 1/4, 113 1/2, 114, 114 1/4, 114 1/2, 115, 115 1/4, 115 1/2, 116, 116 1/4, 116 1/2, 117, 117 1/4, 117 1/2, 118, 118 1/4, 118 1/2, 119, 119 1/4, 119 1/2, 120, 120 1/4, 120 1/2, 121, 121 1/4, 121 1/2, 122, 122 1/4, 122 1/2, 123, 123 1/4, 123 1/2, 124, 124 1/4, 124 1/2, 125, 125 1/4, 125 1/2, 126, 126 1/4, 126 1/2, 127, 127 1/4, 127 1/2, 128, 128 1/4, 128 1/2, 129, 129 1/4, 129 1/2, 130, 130 1/4, 130 1/2, 131, 131 1/4, 131 1/2, 132, 132 1/4, 132 1/2, 133, 133 1/4, 133 1/2, 134, 134 1/4, 134 1/2, 135, 135 1/4, 135 1/2, 136, 136 1/4, 136 1/2, 137, 137 1/4, 137 1/2, 138, 138 1/4, 138 1/2, 139, 139 1/4, 139 1/2, 140, 140 1/4, 140 1/2, 141, 141 1/4, 141 1/2, 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New York Wholesale Prices, December 17, 1879.

HARDWARE.

[illegible]

| | |
|--|-----------------------------------|
| Carriage and Tire, Common..... | dls 7x8 1/2 |
| " Philadelphia, new list..... | dls 60 to 65 |
| " Philadelphia Pattern..... | dls 60 to 75 |
| " Shelton's..... | (low list) dls 60 to 75 |
| H. B. & Carris (old list)..... | dls 60 to 75 |
| Tire, Am. Screw Co.'s, Phila., new list..... | \$ 75, 79, 81, 83, 85 |
| " Bay state..... | dls 70 to 75 |
| " R. B. & W..... | dls 70 to 75 |
| Stove-American Screw Co.'s..... | dls 75 to 80 |
| " R. B. & W..... | dls 40 to 45 |
| Plow..... | dls 40 to 45 |
| " R. B. & W..... | dls 50 to 55 |
| Machine, List of July 15, '79..... | dls 55 to 60 |
| Bolt Ends..... | dls 55 to 60 |
| Boxes. | 10¢ per 15 lbs or net |
| Boxing Machines. Upright, Angulo..... | |
| First quality, no Augers.....\$-50..... | \$6 75 .. dls 40 to |
| " "with Augers.....8-50..... | 10 25 .. dls 40 to |
| Snell'P..no Augers.....2-75..... | 3 50 net. |
| Phillips' with Augers..... | 10 00 dls 40 to |
| Boxes.—Harter's Patent..... | dls 40 to 45 |
| O. S. Backus..... | dls 50 to 55 |
| Winson Mfg. Co.'s..... | dls 10 to 15 |
| Spooford's Patent..... | dls 40 to 45 |
| Noble's Patent..... | dls 40 to 45 |
| Ives' Patent Braces..... | dls 50 to 55 |
| Common Ball (American)..... | dls 50 to 55 |
| Brackets.—Shelf (Sargent's) Fancy..... | dls 45 to 50 |
| Bright Wire Goods list at Dec. 15, 1879, dls 60 to 65 | |
| Hull Riggs—Union Nut Co..... | dls 50 to 55 |
| Sargent's..... | dls 60 to 65 |
| Futchicks..... | (low list) dls 35 to 40 |
| Lumason Beckley & Co.'s (low list)..... | dls 60 to 65 |
| Butts. | |
| Wrought Brass..... | dls 45 to 50 |
| Last Brass, Tiebout's..... | dls 40 to 45 |
| " Corbin's..... | dls 50 to 55 |
| COMMON CAST, NOT DRILLED. | |
| Fast Joint, Narrow..... | dls 40 to 45 |
| " Broad..... | dls 40 to 45 |
| Joint, Narrow and Broad..... | dls 50 to 55 |
| DRILLED AND WIRED. | |
| Fast Joint, Narrow..... | dls 40 to 45 |
| " Broad..... | dls 40 to 45 |
| Low Joint..... | dls 40 to 45 |
| Japanned..... | dls 40 to 45 |
| " with Acorn..... | dls 40 to 45 |
| Parliament Butts..... | dls 40 to 45 |
| Keyer Hinges..... | dls 40 to 45 |
| Joint Pin no Acorn..... | dls 40 to 45 |
| " Acorns..... | dls 40 to 45 |
| " Japanned..... | dls 40 to 45 |
| " Plated Tins..... | dls 55 to 60 |
| WOODRIFT IRON. | |
| Fast Joint Narrow..... | dls 40 to 45 |
| " L. Narrow..... | dls 40 to 45 |
| " Broad..... | dls 40 to 45 |
| Loose Joint, Broad..... | dls 40 to 45 |
| Table Butts, Castings, &c..... | dls 40 to 45 |
| Inside Blind, Regular..... | dls 40 to 45 |
| " Light..... | dls 40 to 45 |
| Stone Pin, Wrt..... | dls 40 to 45 |
| Spring Hinges: | |
| American Spiral Spring Butt Co., Jap'd..... | dls 25 to 30 |
| " "Fancy..... | dls 25 to 30 |
| Gem Spiral Spring Butts, Japanned..... | dls 25 to 30 |
| " Ornamental..... | dls 25 to 30 |
| Geer's Single and Double Acting..... | dls 25 to 30 |
| Sabin Mfg. Co.'s Double Acting..... | dls 25 to 30 |
| Union Sprial Spring, Japanned..... | dls 25 to 30 |
| " Ornamental..... | dls 25 to 30 |
| Union Spring Hinge Co.'s..... | dls 25 to 30 |
| American Spring Hinge Co.'s..... | dls 25 to 30 |
| Union Mfg. Co..... | dls 25 to 30 |
| Bommer's..... | dls 25 to 30 |
| Blind Butts, Parker..... | dls 40 to 45 |
| " Palmer..... | dls 35 to 40 |
| " Seymour..... | dls 40 to 45 |
| " Shepard's "Double Locking"..... | dls 40 to 45 |
| " "No Hand"..... | dls 40 to 45 |
| " Shepard's "Noiseless," Nos. 1 to 6 C..... | dls 40 to 45 |
| " Lull & Porter..... | dls 60 to 65 |
| Nicholson..... | dls 40 to 45 |
| Hubber, A. F..... | dls 40 to 45 |
| " Clark's No. 10 and 45..... | dls 40 to 45 |
| " Sargent's No. 12..... | dls 40 to 45 |
| How Pins. | |
| Rotchicks..... | (low list) dls 10 to 15 |
| Humason, Beckley & Co.'s (low list)..... | dls 40 to 45 |
| " "Steel..... | \$ 15 to \$ 25 and \$ 25 to \$ 35 |
| Butcher's Cleavers. | |
| Humason & Beckley Mfg. Co..... | dls 25 to 30 |
| Bradley's..... | dls 25 to 30 |
| Beattie's..... | dls 25 to 30 |
| \$ 15 50 10 00 21 50 24 00 27 00 30 00 33 50 36 50 | |
| Cutn Openers. | |
| Tracey, O. P. Comet..... | \$ dor \$20.00, dls 25 to |
| American..... | \$ dor \$20.00, dls 25 to |
| Duplex..... | \$ dor \$20.00, dls 25 to |
| Wood's New Hammer..... | \$ dor \$20.00, dls 25 to |
| Poole..... | \$ dor \$25.00, dls 30 to |
| No. 4 French..... | \$ dor \$25.00, dls 30 to |
| Clark's Iron Hammer..... | \$ dor \$25.00, dls 30 to |
| Eureka..... | \$ dor \$25.00, dls 30 to |
| Star..... | \$ dor \$25.00, dls 30 to |
| Sardine Scissors..... | \$ dor \$25.00, dls 30 to |
| Car..... | \$ dor \$25.00, dls 30 to |
| Sprague..... | \$ dor \$25.00, dls 30 to |
| Cups.—Perfection, # 1000. | |
| U. M. C., P. C. Trimmed..... | \$ dor \$20.00, dls 25 to |
| Woods'..... | \$ dor \$20.00, dls 25 to |
| G. D. & S. B..... | \$ dor \$20.00, dls 25 to |
| Double Waterproof, In -1879..... | \$ dor \$20.00, dls 25 to |
| Co's Flat,..... | \$ dor \$20.00, dls 25 to |
| Metal, 1-to..... | \$ dor \$20.00, dls 25 to |
| F. L..... | \$ dor \$20.00, dls 25 to |
| Co's Flat,..... | \$ dor \$20.00, dls 25 to |
| E. B. 1-to Ground Edge..... | \$ dor \$20.00, dls 25 to |
| Cartridges.—Metallic. | |
| Cards.—Horse and Curry..... | dls 10 to 15 |
| Cotton..... | dls 10 to 15 |
| Co's Flat,..... | dls 10 to 15 |
| Car Pusher.—"Giant"..... | \$6 25 each, dls 20 to |
| Carpet Stretchers. | |
| Cast Steel, Polished..... | \$ pair \$20.00, dls 50 to |
| " Iron Steel Points..... | \$ dor \$20.00, dls 50 to |
| Casters. | |
| Bed..... | dls 30 to 35 |
| Plate and Shallow Socket..... | dls 30 to 35 |
| Co's Flat,..... | dls 30 to 35 |
| Cattle Leaders. | |
| Hatchicks' Sons..... | dls 10 to 15 |
| Humason, Beckley & Co.'s (low list)..... | dls 40 to 45 |
| Sargent's..... | |

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|--|------------------|-------------|
| Cocks, Brass..... | | dis 35 |
| Hacking..... | | dis 35 |
| Globe..... | | dis 35 |
| Plain Ribbs..... | | dis 35 |
| Alb..... | | dis 35 |
| Coffee Mills..... | | dis 25 |
| Board and Box..... | ..... | dis 25 |
| Increase of Lion's..... | ..... | dis 25 |
| American (Enterprise Mfg. Co.)..... | \$5.50, \$10.50, | dis 25 |
| French Steel..... | ..... | dis 25 |
| Combined Dinner Pail and Lantern..... | ..... | dis 30 |
| Per doz \$1.00..... | ..... | dis 30 |
| Companes, Dividers, &c..... | ..... | dis 10 to 5 |
| Callipers..... | ..... | dis 10 to 5 |
| Dividers..... | ..... | dis 10 to 5 |
| Bevel & Call's Dividers..... | ..... | dis 10 to 5 |
| Compasses & Callipers..... | ..... | dis 10 to 5 |
| Wing & Inside or Outside..... | ..... | dis 10 to 5 |
| Call's Pat. Inside..... | ..... | dis 10 to 5 |
| Cook's..... | ..... | dis 25 |
| Double..... | ..... | dis 25 |
| Muller's Patent..... | ..... | dis 25 |
| Coppers' Tools..... | ..... | dis 10 to 5 |
| Corkscrews..... | ..... | dis 35 |
| Corn Knives and Cutters..... | ..... | dis 10 |
| Wadsworth's..... | ..... | dis 35 |
| Crow Bars..... | ..... | dis 70 |
| Iron, Steel Points..... | ..... | dis 50 |
| Curling Irons, &c..... | ..... | dis 10 |
| Curling Tongs..... | ..... | dis 10 |
| Pinchers Irons..... | ..... | dis 10 |
| Fitch's (List of No. 200 \$1.)..... | ..... | dis 40 |
| Honchick's Novelty..... | ..... | dis 20 |
| Lawrence, with detachable Mané Comb..... | ..... | dis 35 |
| Rubber..... | ..... | dis 10 |
| Carlin Pins..... | ..... | dis 15 |
| Cutlery..... | ..... | dis 15 |
| Meriden Cutlery Co. (Table)..... | ..... | dis 15 |
| Amber & Cutlery Co..... | ..... | dis 15 |
| Thomson & Beekley, Pocket..... | ..... | dis 30 |
| F. W. Rogers & Son, A. Pocket..... | ..... | dis 35 |
| Arnold's..... | ..... | dis 35 |
| Arnold's..... | ..... | dis 35 |
| Do Collars..... | ..... | dis 20 |
| Embossed Gilt..... | ..... | dis 20 |
| Brass..... | ..... | dis 20 |
| Door Springs..... | ..... | dis 10 |
| Torrey's Rod..... | ..... | dis 10 |
| Bee Rod..... | ..... | dis 10 |
| Geol..... | ..... | dis 10 |
| No. 1, Large, Japanese..... | ..... | dis 10 |
| No. 2, Medium..... | ..... | dis 10 |
| Challenge (Coll)..... | ..... | dis 10 |
| Japanese..... | ..... | dis 10 |
| Nippert..... | ..... | dis 10 |
| Grass..... | ..... | dis 10 |
| Nickel..... | ..... | dis 10 |
| Japanese..... | ..... | dis 10 |
| Nickel..... | ..... | dis 10 |
| No. 4, "Snoo Fly" Screen door size..... | ..... | dis 10 |
| No. 5, Screen Door size..... | ..... | dis 10 |
| No. 6, Large..... | ..... | dis 10 |
| Sabin's Lever, No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10..... | ..... | dis 10 |
| Sabin's No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10..... | ..... | dis 10 |
| Sabin's Crown..... | ..... | dis 10 |
| Philadelphia..... | ..... | dis 10 |
| Cowell's..... | ..... | dis 10 |
| Rubber, complete..... | ..... | dis 10 |
| Drawing Knives..... | ..... | dis 10 |
| Merrill..... | ..... | dis 10 |
| Robins Mfg. Co..... | ..... | dis 10 |
| Adjustable Hand..... | ..... | dis 10 |
| Withey Tool Co..... | ..... | dis 10 |
| Drills and Drill Stocks..... | ..... | dis 10 |
| Blacksmiths..... | ..... | dis 10 |
| Brass, F. & W..... | ..... | dis 10 |
| Hotchkiss..... | ..... | dis 10 |
| Miller's..... | ..... | dis 10 |
| Bartholomew's..... | ..... | dis 10 |
| Ratchet..... | ..... | dis 10 |
| Whitney's..... | ..... | dis 10 |
| Moore's..... | ..... | dis 10 |
| Whitney's Hand Drill..... | ..... | dis 10 |
| Automatic Boring Tools..... | ..... | dis 10 |
| Drill Chucks..... | ..... | dis 10 |
| Danbury..... | ..... | dis 10 |
| Egg Beaters..... | ..... | dis 10 |
| National..... | ..... | dis 10 |
| Elevator Buckets..... | ..... | dis 10 |
| Mill & Buckets, light, 3 1/2 to 10 in. (Duc's Improved)..... | ..... | dis 10 |
| Storehouse, (Duc's Patent) 12 to 17, \$1.00 to \$2.00..... | ..... | dis 10 |
| Emery and Emery Paper..... | ..... | dis 10 |
| Genuine Chester-Regular Nos..... | ..... | dis 10 |
| Washington Mills-Regular Nos..... | ..... | dis 10 |
| Wellington Mills..... | ..... | dis 10 |
| B. & A. Emery Paper..... | ..... | dis 10 |
| Canned and Tinned Ware..... | ..... | dis 10 |
| Sauce Pans..... | ..... | dis 10 |
| Tinned Sauce Pans..... | ..... | dis 10 |
| Escutcheon Pins..... | ..... | dis 10 |
| Iron..... | ..... | dis 10 |
| Door Lock..... | ..... | dis 10 |
| Brass Thread..... | ..... | dis 10 |
| Faucets..... | ..... | dis 10 |
| Fenn's..... | ..... | dis 10 |
| Fenn's Cork Stops..... | ..... | dis 10 |
| Fry's Patent Petroleum..... | ..... | dis 10 |
| Wood and Metallic..... | ..... | dis 10 |
| Metallic Key, Leather Lined..... | ..... | dis 10 |
| Cork Lined..... | ..... | dis 10 |
| Felice Plates..... | ..... | dis 10 |
| Files..... | ..... | dis 10 |
| Arnold..... | ..... | dis 10 |
| Nicholson..... | ..... | dis 10 |
| Hick & Bros..... | ..... | dis 10 |
| J. & Kiley Carr..... | ..... | dis 10 |
| Johnson & Bro..... | ..... | dis 10 |
| Fisher's..... | ..... | dis 10 |
| H. Diston & Sons new list..... | ..... | dis 10 |
| Western new list..... | ..... | dis 10 |
| Lighting Piles, 5 and 10 in..... | ..... | dis 10 |
| Fluting Machines..... | ..... | dis 10 |
| Knock 4 inch Roll..... | ..... | dis 10 |
| Pecklee, 4 inch Roll..... | ..... | dis 10 |
| Eagle, 3 1/2 inch Roll..... | ..... | dis 10 |
| Eureka, No. 1, 7 inch Roll..... | ..... | dis 10 |
| Star..... | ..... | dis 10 |
| Domestic Fluter..... | ..... | dis 10 |
| Geneva Hand Fluter, No. 1..... | | dis 10 |
| Shepard Hand Fluter..... | | dis |

[illegible][illegible]

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MANUFACTURERS, IMPORTERS, EXPORTERS & GENERAL MERCHANTS
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CAST STEEL WIRE for all Purposes, Special Wire,
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Turns out at least double work by increased speed
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These Blooms are made from selected wrought
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The Company warrants its rails equal in quality to any manufactured in the United States. Rails of any weight or section furnished on short notice. Orders for trial lots solicited.

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BUTCHERS' STEELS,
AND
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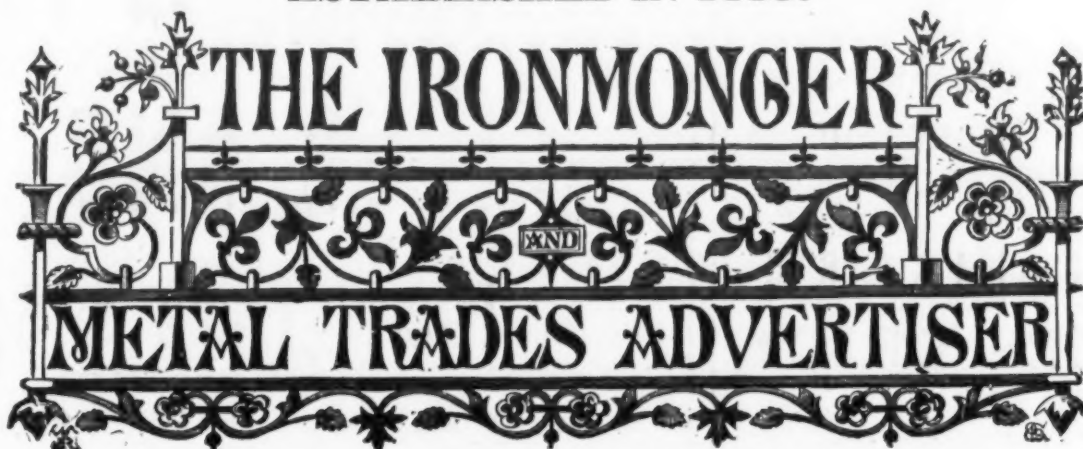
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is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication in 1879 will be as follows: JANUARY 11, FEBRUARY 8, MARCH 8, APRIL 5, MAY 3 and 31, JUNE 28, JULY 26, AUGUST 23, SEPTEMBER 20, OCTOBER 18, NOVEMBER 15, DECEMBER 13.

This Supplement is published in

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of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach out in the native language of eighty millions of *German*, forty-two millions of *French*, twenty-eight millions of *Italian*, and fifty-one millions of *Spanish*-speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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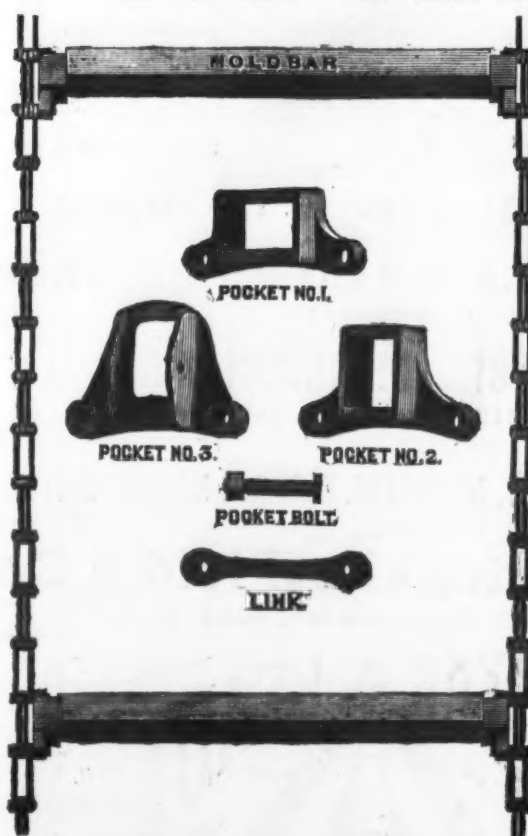
so far as the experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

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| Hann's Red Warrior. | per doz. \$9.00 net |
| Red Indian. | 9.00 net |
| Red Chieftain, beveled. | 9.50 net |
| Crown Prince. | 9.50 net |
| Augers and Auger Bits. | |
| Bates Nut Augers. | dis 40 1/2 |
| Cook's Augers. | dis 40 1/2 |
| Watrous Ship Augers. | dis 40 1/2 |
| Benjamin Pierce Auger Bits. | dis 40 1/2 |
| Gravold Auger Bits. | dis 40 1/2 |
| Cook's. | dis 40 1/2 |
| Jennings. | dis 40 1/2 |
| Bonney's Pat. Hol. Augers, list \$4 1/2 doz. | dis 40 1/2 |
| Stearns' Pat. Hol. Augers, list \$4 1/2 doz. | dis 40 1/2 |
| Balances. | |
| Light and Common. | dis 40 1/2 |
| Bells. | |
| Bell Bros. Mfg. Co. Light Hand Bells. | dis 40 1/2 |
| Swiss Pattern Hand Bells. | low list dis 40 1/2 |
| Connell's Door Bells. | dis 40 1/2 |
| St. Western & Co. new list. | dis 40 1/2 |
| Belt and Rivet Clippers. | |
| Chambers No. 1. For 1/2 bolt. | each, \$7.50 |
| No. 2. | 9.00 |
| No. 3. | 12.00 |
| Boring Machines. | |
| Upright, with Augers. | list \$4.50 dis 40 1/2 |
| without Augers. | 10.25 dis 40 1/2 |
| Angular, with Augers. | 10.25 dis 40 1/2 |
| without Augers. | 6.75 dis 40 1/2 |
| Bolts.—Eastern Carriage Bolts. | dis 40 1/2 |
| Philadelphia new list dis 40 1/2 | |
| Stanley, Wrought Shutter. | dis 40 1/2 |
| Braces.—Barber's. | dis 40 1/2 |
| Backus. | dis 40 1/2 |
| Spofford. | dis 40 1/2 |
| American Ball. | dis 40 1/2 |
| Butts.—Cast Fast Joint, Narrow. | dis 40 1/2 |
| Broad. | dis 40 1/2 |
| Cast Loose Joint, Narrow. | dis 40 1/2 |
| Broad. | dis 40 1/2 |
| Aaron, Loose Pin. | dis 40 1/2 |
| Pin. | dis 40 1/2 |
| Maver's Loose Joint. | dis 40 1/2 |
| Wrought Loose Pin. | dis 40 1/2 |
| Table Hinges and Back Flaps. | dis 40 1/2 |
| Narrow, Fast. | dis 40 1/2 |
| Loose Joint. | dis 40 1/2 |
| Bilied Balls. | |
| Parker. | dis 40 1/2 |
| Clark. | dis 40 1/2 |
| Shepard. | dis 40 1/2 |
| Lull & Porter. | dis 40 1/2 |
| Huffer. | dis 40 1/2 |
| Chains.—German Halter and Coll. new list Oct. 27. | |
| Galvanized Pump. | dis 40 1/2 |
| Best Proof Coll Chain—English. | dis 40 1/2 |
| 1/2 in. 10 lb. 100 ft. | dis 40 1/2 |
| 1/2 in. 10 lb. 100 ft. | dis 40 1/2 |
| 1/2 in. 10 lb. 100 ft. | dis 40 1/2 |
| Chisels.—Socket Framing. | dis 40 1/2 |
| Socket Primer. | dis 40 1/2 |
| Butcher's. | dis 40 1/2 |
| Casters.—Bed. | dis 40 1/2 |
| Plate. | dis 40 1/2 |
| Coffee Mills.—Box and Side. | dis 40 1/2 |
| Enterprise. | dis 40 1/2 |
| Cutlery.—Walden Pocket. | new list net |
| Landers, Fray & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net. | |
| Drawing Knives. | |
| Hart Mfg. Co.'s. | dis 40 1/2 |
| Adjustable Handle. | dis 40 1/2 |
| Fry Pans. | |
| Finned. | dis 40 1/2 |
| No. 10. 10 in. 4 lb. 4.00 | dis 40 1/2 |
| No. 12. 12 in. 5 lb. 5.00 | dis 40 1/2 |
| No. 14. 14 in. 6 lb. 6.00 | dis 40 1/2 |
| No. 16. 16 in. 7 lb. 7.00 | dis 40 1/2 |
| No. 18. 18 in. 8 lb. 8.00 | dis 40 1/2 |
| No. 20. 20 in. 9 lb. 9.00 | dis 40 1/2 |
| No. 22. 22 in. 10 lb. 10.00 | dis 40 1/2 |
| No. 24. 24 in. 11 lb. 11.00 | dis 40 1/2 |
| No. 26. 26 in. 12 lb. 12.00 | dis 40 1/2 |
| No. 28. 28 in. 13 lb. 13.00 | dis 40 1/2 |
| No. 30. 30 in. 14 lb. 14.00 | dis 40 1/2 |
| No. 32. 32 in. 15 lb. 15.00 | dis 40 1/2 |
| No. 34. 34 in. 16 lb. 16.00 | dis 40 1/2 |
| No. 36. 36 in. 17 lb. 17.00 | dis 40 1/2 |
| No. 38. 38 in. 18 lb. 18.00 | dis 40 1/2 |
| No. 40. 40 in. 19 lb. 19.00 | dis 40 1/2 |
| No. 42. 42 in. 20 lb. 20.00 | dis 40 1/2 |
| No. 44. 44 in. 21 lb. 21.00 | dis 40 1/2 |
| No. 46. 46 in. 22 lb. 22.00 | dis 40 1/2 |
| No. 48. 48 in. 23 lb. 23.00 | dis 40 1/2 |
| No. 50. 50 in. 24 lb. 24.00 | dis 40 1/2 |
| No. 52. 52 in. 25 lb. 25.00 | dis 40 1/2 |
| No. 54. 54 in. 26 lb. 26.00 | dis 40 1/2 |
| No. 56. 56 in. 27 lb. 27.00 | dis 40 1/2 |
| No. 58. 58 in. 28 lb. 28.00 | dis 40 1/2 |
| No. 60. 60 in. 29 lb. 29.00 | dis 40 1/2 |
| No. 62. 62 in. 30 lb. 30.00 | dis 40 1/2 |
| No. 64. 64 in. 31 lb. 31.00 | dis 40 1/2 |
| No. 66. 66 in. 32 lb. 32.00 | dis 40 1/2 |
| No. 68. 68 in. 33 lb. 33.00 | dis 40 1/2 |
| No. 70. 70 in. 34 lb. 34.00 | dis 40 1/2 |
| No. 72. 72 in. 35 lb. 35.00 | dis 40 1/2 |
| No. 74. 74 in. 36 lb. 36.00 | dis 40 1/2 |
| No. 76. 76 in. 37 lb. 37.00 | dis 40 1/2 |
| No. 78. 78 in. 38 lb. 38.00 | dis 40 1/2 |
| No. 80. 80 in. 39 lb. 39.00 | dis 40 1/2 |
| No. 82. 82 in. 40 lb. 40.00 | dis 40 1/2 |
| No. 84. 84 in. 41 lb. 41.00 | dis 40 1/2 |
| No. 86. 86 in. 42 lb. 42.00 | dis 40 1/2 |
| No. 88. 88 in. 43 lb. 43.00 | dis 40 1/2 |
| No. 90. 90 in. 44 lb. 44.00 | dis 40 1/2 |
| No. 92. 92 in. 45 lb. 45.00 | dis 40 1/2 |
| No. 94. 94 in. 46 lb. 46.00 | dis 40 1/2 |
| No. 96. 96 in. 47 lb. 47.00 | dis 40 1/2 |
| No. 98. 98 in. 48 lb. 48.00 | dis 40 1/2 |
| No. 100. 100 in. 49 lb. 49.00 | dis 40 1/2 |
| No. 102. 102 in. 50 lb. 50.00 | dis 40 1/2 |
| No. 104. 104 in. 51 lb. 51.00 | dis 40 1/2 |
| No. 106. 106 in. 52 lb. 52.00 | dis 40 1/2 |
| No. 108. 108 in. 53 lb. 53.00 | dis 40 1/2 |
| No. 110. 110 in. 54 lb. 54.00 | dis 40 1/2 |
| No. 112. 112 in. 55 lb. 55.00 | dis 40 1/2 |
| No. 114. 114 in. 56 lb. 56.00 | dis 40 1/2 |
| No. 116. 116 in. 57 lb. 57.00 | dis 40 1/2 |
| No. 118. 118 in. 58 lb. 58.00 | dis 40 1/2 |
| No. 120. 120 in. 59 lb. 59.00 | dis 40 1/2 |
| No. 122. 122 in. 60 lb. 60.00 | dis 40 1/2 |
| No. 124. 124 in. 61 lb. 61.00 | dis 40 1/2 |
| No. 126. 126 in. 62 lb. 62.00 | dis 40 1/2 |
| No. 128. 128 in. 63 lb. 63.00 | dis 40 1/2 |
| No. 130. 130 in. 64 lb. 64.00 | dis 40 1/2 |
| No. 132. 132 in. 65 lb. 65.00 | dis 40 1/2 |
| No. 134. 134 in. 66 lb. 66.00 | dis 40 1/2 |
| No. 136. 136 in. 67 lb. 67.00 | dis 40 1/2 |
| No. 138. 138 in. 68 lb. 68.00 | dis 40 1/2 |
| No. 140. 140 in. 69 lb. 69.00 | dis 40 1/2 |
| No. 142. 142 in. 70 lb. 70.00 | dis 40 1/2 |
| No. 144. 144 in. 71 lb. 71.00 | dis 40 1/2 |
| No. 146. 146 in. 72 lb. 72.00 | dis 40 1/2 |
| No. 148. 148 in. 73 lb. 73.00 | dis 40 1/2 |
| No. 150. 150 in. 74 lb. 74.00 | dis 40 1/2 |
| No. 152. 152 in. 75 lb. 75.00 | dis 40 1/2 |
| No. 154. 154 in. 76 lb. 76.00 | dis 40 1/2 |
| No. 156. 156 in. 77 lb. 77.00 | dis 40 1/2 |
| No. 158. 158 in. 78 lb. 78.00 | dis 40 1/2 |
| No. 160. 160 in. 79 lb. 79.00 | dis 40 1/2 |
| No. 162. 162 in. 80 lb. 80.00 | dis 40 1/2 |
| No. 164. 164 in. 81 lb. 81.00 | dis 40 1/2 |
| No. 166. 166 in. 82 lb. 82.00 | dis 40 1/2 |
| No. 168. 168 in. 83 lb. 83.00 | dis 40 1/2 |
| No. 170. 170 in. 84 lb. 84.00 | dis 40 1/2 |
| No. 172. 172 in. 85 lb. 85.00 | dis 40 1/2 |
| No. 174. 174 in. 86 lb. 86.00 | dis 40 1/2 |
| No. 176. 176 in. 87 lb. 87.00 | dis 40 1/2 |
| No. 178. 178 in. 88 lb. 88.00 | dis 40 1/2 |
| No. 180. 180 in. 89 lb. 89.00 | dis 40 1/2 |
| No. 182. 182 in. 90 lb. 90.00 | dis 40 1/2 |
| No. 184. 184 in. 91 lb. 91.00 | dis 40 1/2 |
| No. 186. 186 in. 92 lb. 92.00 | dis 40 1/2 |
| No. 188. 188 in. 93 lb. 93.00 | dis 40 1/2 |
| No. 190. 190 in. 94 lb. 94.00 | dis 40 1/2 |
| No. 192. 192 in. 95 lb. 95.00 | dis 40 1/2 |
| No. 194. 194 in. 96 lb. 96.00 | dis 40 1/2 |
| No. 196. 196 in. 97 lb. 97.00 | dis 40 1/2 |
| No. 198. 198 in. 98 lb. 98.00 | dis 40 1/2 |
| No. 200. 200 in. 99 lb. 99.00 | dis 40 1/2 |
| No. 202. 202 in. 100 lb. 100.00 | dis 40 1/2 |
| No. 204. 204 in. 101 lb. 101.00 | dis 40 1/2 |
| No. 206. 206 in. 102 lb. 102.00 | dis 40 1/2 |
| No. 208. 208 in. 103 lb. 103.00 | dis 40 1/2 |
| No. 210. 210 in. 104 lb. 104.00 | dis 40 1/2 |
| No. 212. 212 in. 105 lb. 105.00 | dis 40 1/2 |
| No. 214. 214 in. 106 lb. 106.00 | dis 40 1/2 |
| No. 216. 216 in. 107 lb. 107.00 | dis 40 1/2 |
| No. 218. 218 in. 108 lb. 108.00 | dis 40 1/2 |
| No. 220. 220 in. 109 lb. 109.00 | dis 40 1/2 |
| No. 222. 222 in. 110 lb. 110.00 | dis 40 1/2 |
| No. 224. 224 in. 111 lb. 111.00 | dis 40 1/2 |
| No. 226. 226 in. 112 lb. 112.00 | dis 40 1/2 |
| No. 228. 228 in. 113 lb. 113.00 | dis 40 1/2 |
| No. 230. 230 in. 114 lb. 114.00 | dis 40 1/2 |
| No. 232. 232 in. 115 lb. 115.00 | dis 40 1/2 |
| No. 234. 234 in. 116 lb. 116.00 | dis 40 1/2 |
| No. 236. 236 in. 117 lb. 117.00 | dis 40 1/2 |
| No. 238. 238 in. 118 lb. 118.00 | dis 40 1/2 |
| No. 240. 240 in. 119 lb. 119.00 | dis 40 1/2 |
| No. 242. 242 in. 120 lb. 120.00 | dis 40 1/2 |
| No. 244. 244 in. 121 lb. 121.00 | dis 40 1/2 |
| No. 246. 246 in. 122 lb. 122.00 | dis 40 1/2 |
| No. 248. 248 in. 123 lb. 123.00 | dis 40 1/2 |
| No. 250. 250 in. 124 lb. 124.00 | dis 40 1/2 |
| No. 252. 252 in. 125 lb. 125.00 | dis 40 1/2 |
| No. 254. 254 in. 126 lb. 126.00 | dis 40 1/2 |
| No. 256. 256 in. 127 lb. 127.00 | dis 40 1/2 |
| No. 258. 258 in. 128 lb. 128.00 | dis 40 1/2 |
| No. 260. 260 in. 129 lb. 129.00 | dis 40 1/2 |
| No. 262. 262 in. 130 lb. 130.00 | dis 40 1/2 |
| No. 264. 264 in. 131 lb. 131.00 | dis 40 1/2 |
| No. 266. 266 in. 132 lb. 132.00 | dis 40 1/2 |
| No. 268. 268 in. 133 lb. 133.00 | dis 40 1/2 |
| No. 270. 270 in. 134 lb. 134.00 | dis 40 1/2 |
| No. 272. 272 in. 135 lb. 135.00 | dis 40 1/2 |
| No. 274. 274 in. 136 lb. 136.00 | dis 40 1/2 |
| No. 276. 276 in. 137 lb. 137.00 | dis 40 1/2 |
| No. 278. 278 in. 138 lb. 138.00 | dis 40 1/2 |
| No. 280. 280 in. 139 lb. 139.00 | dis 40 1/2 |
| No. 282. 282 in. 140 lb. 140.00 | dis 40 1/2 |
| No. 284. 284 in. 141 lb. 141.00 | dis 40 1/2 |
| No. 286. 286 in. 142 lb. 142.00 | dis 40 1/2 |
| No. 288. 288 in. 143 lb. 143.00 | dis 40 1/2 |
| No. 290. 290 in. 144 lb. 144.00 | dis 40 1/2 |
| No. 292. 292 in. 145 lb. 145.00 | dis 40 1/2 |
| No. 294. 294 in. 146 lb. 146.00 | dis 40 1/2 |
| No. 296. 296 in. 147 lb. 147.00 | dis 40 1/2 |
| No. 298. 298 in. 148 lb. 148.00 | dis 40 1/2 |
| No. 300. 300 in. 149 lb. 149.00 | dis 40 1/2 |
| No. 302. 302 in. 150 lb. 150.00 | dis 40 1/2 |
| No. 304. 304 in. 151 lb. 151.00 | dis 40 1/2 |
| No. 306. 306 in. 152 lb. 152.00 | dis 40 1/2 |
| No. 308. 308 in. 153 lb. 153.00 | dis 40 1/2 |
| No. 310. 310 in. 154 lb. 154.00 | dis 40 1/2 |
| No. 312. 312 in. 155 lb. 155.00 | dis 40 1/2 |
| No. 314. 314 in. 156 lb. 156.00 | dis 40 1/2 |
| No. 316. 316 in. 157 lb. 157.00 | dis 40 1/2 |
| No. 318. 318 in. 158 lb. 158.00 | dis 40 1/2 |
| No. 320. 320 in. 159 lb. 159.00 | dis 40 1/2 |
| No. 322. 322 in. 160 lb. 160.00 | dis 40 1/2 |
| No. 324. 324 in. 161 lb. 161.00 | dis 40 1/2 |
| No. 326. 326 in. 162 lb. 162.00 | dis 40 1/2 |
| No. 328. 328 in. 163 lb. 163.00 | dis 40 1/2 |
| No. 330. 330 in. 164 lb. 164.00 | dis 40 1/2 |
| No. 332. 332 in. 165 lb. 165.00 | dis 40 1/2 |
| No. 334. 334 in. 166 lb. 166.00 | dis 40 1/2 |
| No. 336. 336 in. 167 lb. 167.00 | dis 40 1/2 |
| No. 338. 338 in. 168 lb. 168.00 | dis 40 1/2 |
| No. 340. 340 in. 169 lb. 169.00 | dis 40 1/2 |
| No. 342. 342 in. 170 lb. 170.00 | dis 40 1/2 |
| No. 344. 344 in. 171 lb. 171.00 | dis 40 1/2 |
| No. 346. 346 in. 172 lb. 172.00 | dis 40 1/2 |
| No. 348. 348 in. 173 lb. 173.00 | dis 40 1/2 |
| No. 350. 350 in. 174 lb. 174.00 | dis 40 1/2 |
| No. 352. 352 in. 175 lb. 175.00 | dis 40 1/2 |
| No. 354. 354 in. 176 lb. 176.00 | dis 40 1/2 |
| No. 356. 356 in. 177 lb. 177.00 | dis 40 1/2 |
| No. 358. 358 in. 178 lb. 178.00 | dis 40 1/2 |
| No. 360. 360 in. 179 lb. 179.00 | dis 40 1/2 |
| No. 362. 362 in. 180 lb. 180.00 | dis 40 1/2 |
| No. 364. 364 in. 181 lb. 181.00 | dis 40 1/2 |
| No. 366. 366 in. 182 lb. 182.00 | dis 40 1/2 |
| No. 368. 368 in. 183 lb. 183.00 | dis 40 1/2 |
| No. 370. 370 in. 184 lb. 184.00 | dis 40 1/2 |
| No. 372. 372 in. 185 lb. 185.00 | dis 40 1/2 |
| No. 374. 374 in. 186 lb. 186.00 | dis 40 1/2 |
| No. 376. 376 in. 187 lb. 187.00 | dis 40 1/2 |
| No. 378. 378 in. 188 lb. 188.00 | dis 40 1/2 |
| No. 380. 380 in. 189 lb. 189.00 | dis 40 1/2 |
| No. 382. 382 in. 190 lb. 190.00 | dis 40 1/2 |
| No. 384. 384 in. 191 lb. 191.00 | dis 40 1/2 |
| No. 386. 386 in. 192 lb. 192.00 | dis 40 1/2 |
| No. 388. 388 in. 193 lb. 193.00 | dis 40 1/2 |
| No. 390. 390 in. 194 lb. 194.00 | dis 40 1/2 |
| No. 392. 392 in. 195 lb. 195.00 | dis 40 1/2 |
| No. 394. 394 in. 196 lb. 196.00 | dis 40 1/2 |
| No. 396. 396 in. 197 lb. 197.00 | dis 40 1/2 |
| No. 398. 398 in. 198 lb. 198.00 | dis 40 1/2 |
| No. 400. 400 in. 199 lb. 199.00 | dis 40 1/2 |
| No. 402. 402 in. 200 lb. 200.00 | dis 40 1/2 |
| No. 404. 404 in. 201 lb. 201.00 | dis 40 1/2 |
| No. 406. 406 in. 202 lb. 202.00 | dis 40 1/2 |
| No. 408. 408 in. 203 lb. 203.00 | dis 40 1/2 |
| No. 410. 410 in. 204 lb. 204.00 | dis 40 1/2 |
| No. 412. 412 in. 205 lb. 205.00 | dis 40 1/2 |
| No. 414. 414 in. 206 lb. 206.00 | dis 40 1/2 |
| No. 416. 416 in. 207 lb. 207.00 | dis 40 1/2 |
| No. 418. 418 in. 208 lb. 208.00 | dis 40 1/2 |
| No. 420. 420 in. 209 lb. 209.00 | dis 40 1/2 |
| No. 422. 422 in. 210 lb. 210.00 | dis 40 1/2 |
| No. 424. 424 in. 211 lb. 211.00 | dis 40 1/2 |
| No. 426. 426 in. 212 lb. 212.00 | dis 40 1/2 |
| No. 428. 428 in. 213 lb. 213.00 | dis 40 1/2 |
| No. 430. 430 in. 214 lb. 214.00 | dis 40 1/2 |
| No. 432. 432 in. 215 lb. 215.00 | dis 40 1/2 |
| No. 434. 434 in. 216 lb. 216.00 | dis 40 1/2 |
| No. 436. 436 in. 217 lb. 217.00 | dis 40 1/2 |

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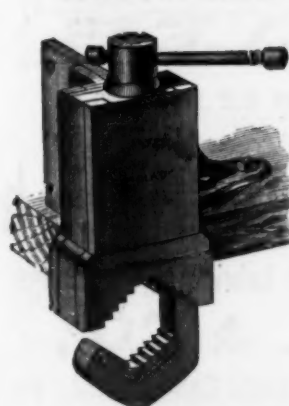
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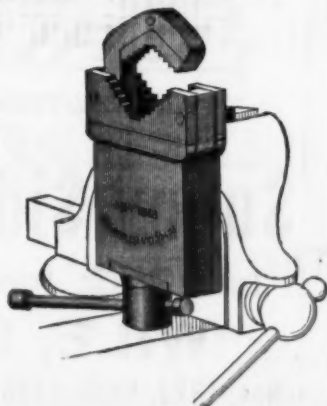
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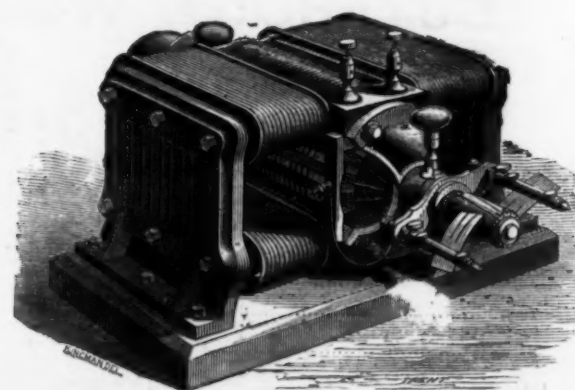
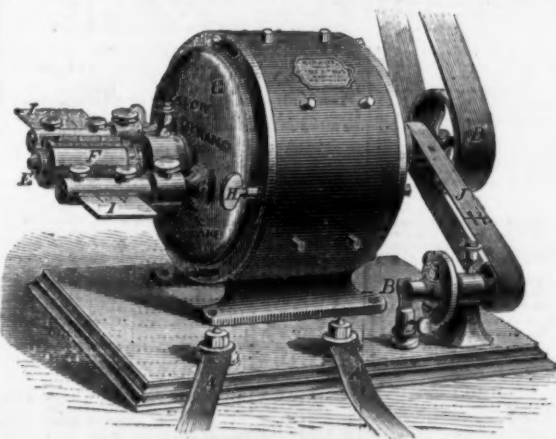
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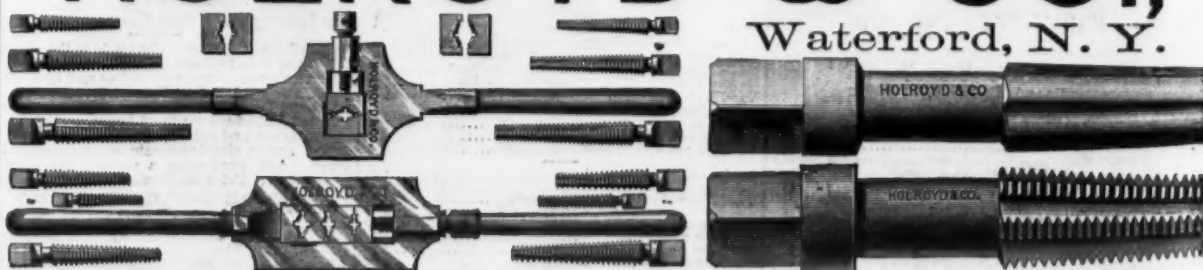
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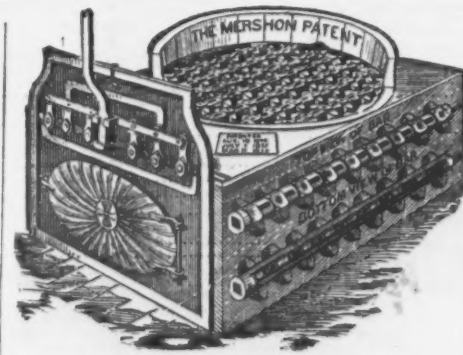
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1843.

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Rubber-Cushioned Casting Brush.
Superior to any in the Market.



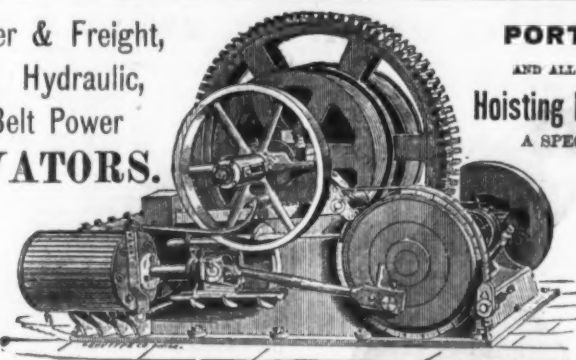
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This is the most complete, easiest working, and the most successful grate and bar ever invented. The attention of manufacturers of boilers and heaters is especially called to it. It has the largest air surface of any grate manufactured, and will generate more heat and steam with the same amount of coal than any other grate. Several sizes supplied, ranging from 18 inches to 30 inches diameter. Send for descriptive circular. For license to foundries and others to manufacture address **Pennsylvania Heating and Ventilating Works, N. Y. Cor. Twelfth and Filbert streets, Philadelphia, Pa.**

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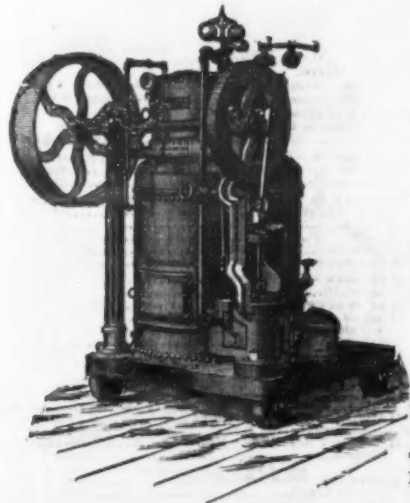


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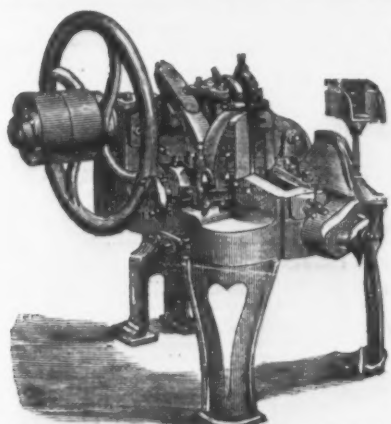
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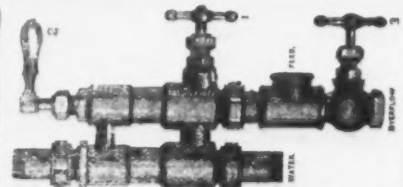
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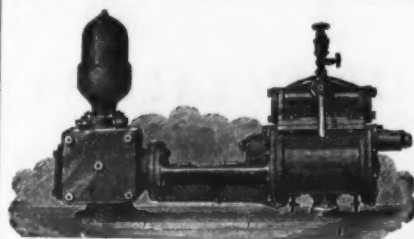
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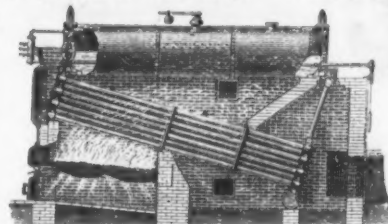
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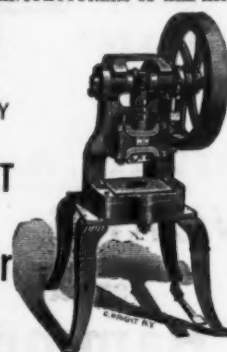
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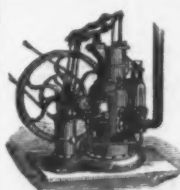


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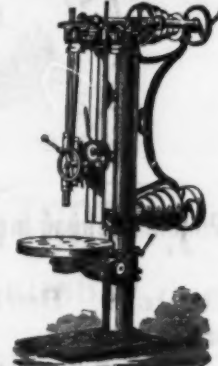
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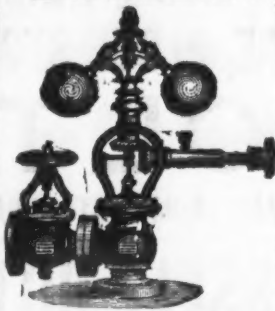
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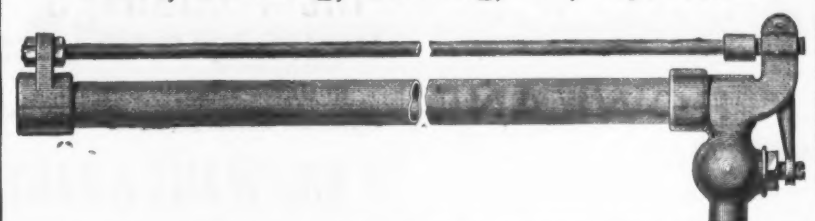
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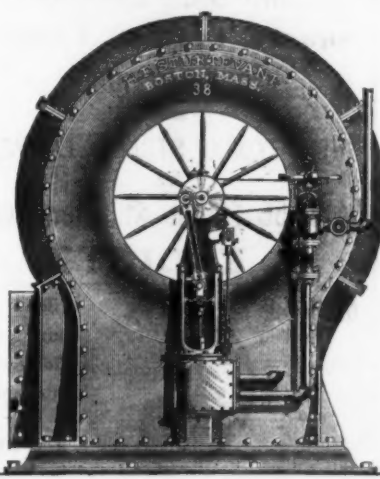
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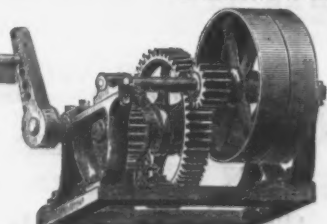
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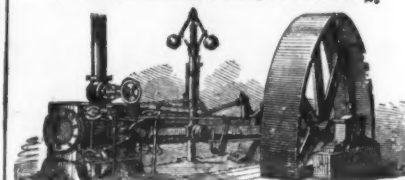


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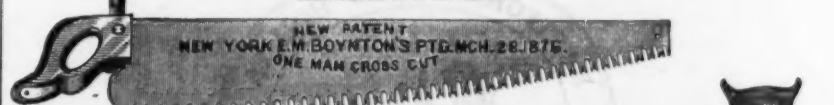


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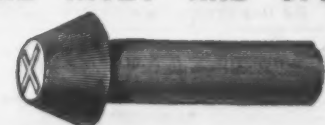
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